

OS/2

A G A Z I N E

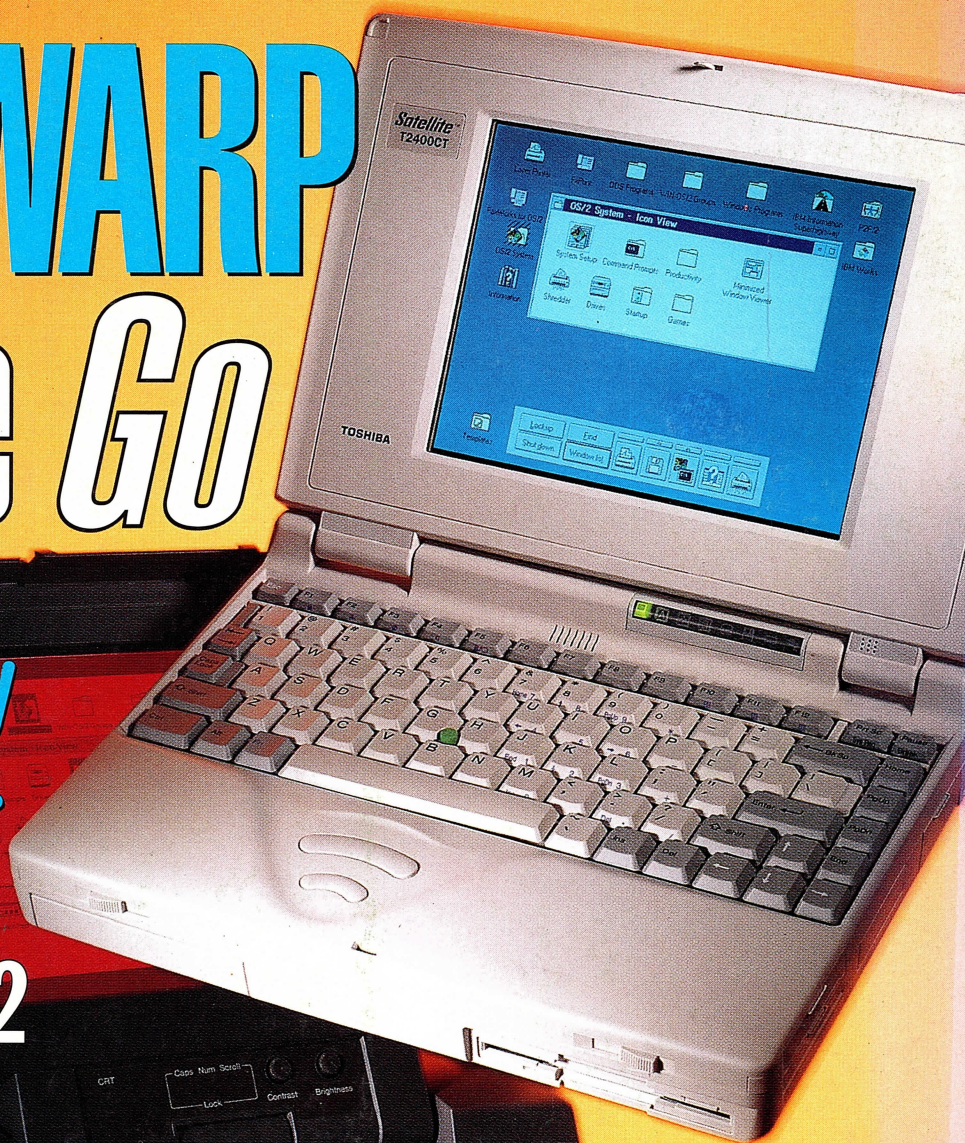
Reviews:

LANTastic for OS/2
Notes 3.2
PageTurner
RemoteOS

OS/2 WARP On The Go

Choosing an
OS/2-friendly
notebook PC.
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CP/IP for OS/2
How The Internet
Protocol Works



US \$3.95 / Canada \$3.95



A man in a dark suit, white shirt, and patterned tie is smiling and clapping his hands. In the background, a red Mazda sports car is visible. The text is overlaid on the image in a bold, white, sans-serif font with a black outline.

MAZDA'S I.S. CHIEF

CAN'T WAIT TO

GET WARPED.



OS/2 is in its third rev, so
it's solid, stable, and mature.

Mike Anzis is the I.S.

man behind the wheel of

Mazda's computers. And

OS/2® Warp is about to

make his life easier.

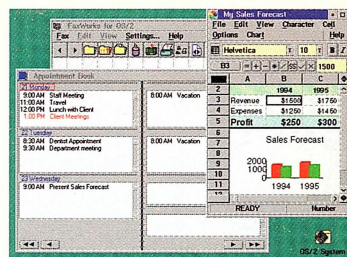
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client/server system,

the OS/2 family

now scales an even



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the applications they need.

As Mike puts it: "We use OS/2 on our head-

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haven't been able to get

OS/2 everywhere we need it - on laptops in the

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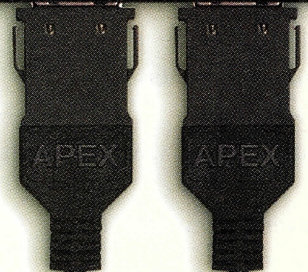
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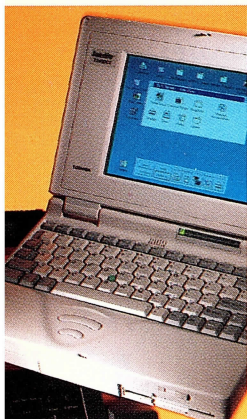
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than one call 1-800-841-APEX*

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TCP/IP is the *de facto* standard protocol for large computer networks, including the Internet. Using TCP/IP, OS/2 computers and networks can be integrated into a larger world of mainframe, UNIX, and other LANs and WANs. Let’s explore TCP/IP, and its various commands and utilities. *By Bob Panza*

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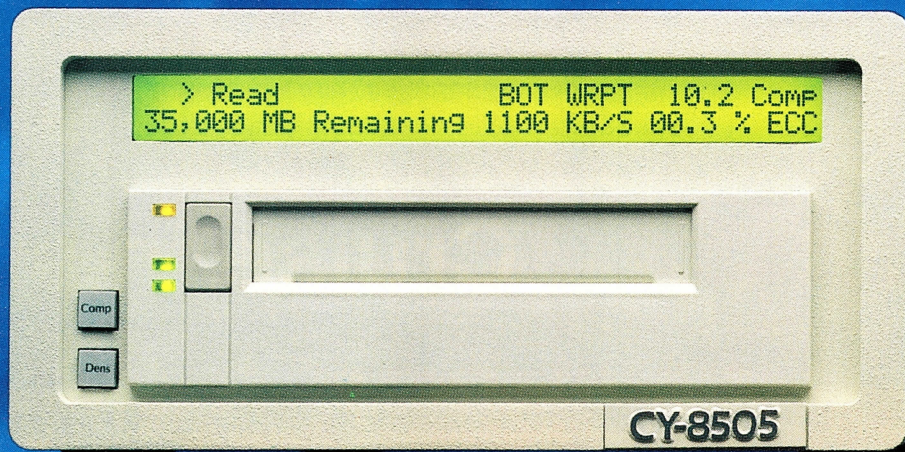
■ To find the number nearest you, dial 800-346-3247 with your modem (in Canada, dial 800-635-6225, voice only). When the modem connects, press Enter. At the Host Name prompt, enter PHONES. Follow the menus and note the number closest to you. Then hang up and dial the number you have just found.

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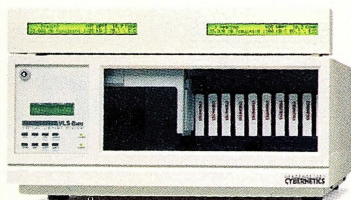
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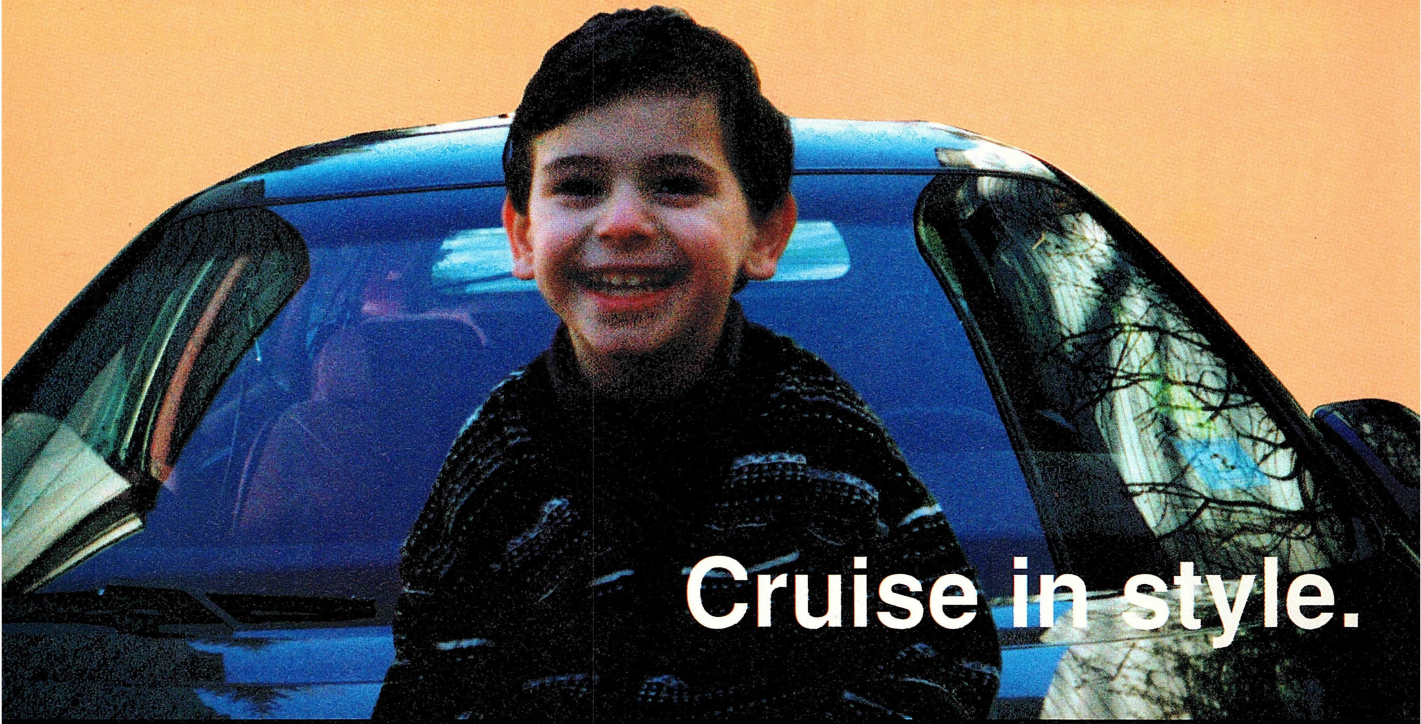
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Perspectives

The Compatible Solution

Have you ever noticed how OS/2 Warp and Windows 95 are treated oh, so differently by the general PC press? To pick one example: IBM executives are often asked about the timetable for OS/2's support of native Windows 95 applications. The reporter's expectation is clearly that OS/2 must support such applications, preferably the very day that Windows 95 finally ships.

On the other hand, how many native OS/2 applications will run under Windows 95? There are thousands of such applications, including many unique corporate solutions that have never been written for any flavor of Windows. I've never seen an interview with Microsoft executives that even speculates about Windows 95's ability to run those OS/2 applications. The unstated supposition, of course, is that there's no need for Microsoft to even consider OS/2 compatibility.

Here's my challenge to general PC newspapers and magazines: If you want to be truly impartial, measure all desktop operating systems with the same yardstick. Over the years, you've hammered OS/2 2.0 for its limited support of Windows 3.1 applications, and nailed OS/2 2.1 for not supporting Windows 3.11 and Windows for Workgroups 3.11.

Isn't it fair to apply the same tests to Windows 95? When it finally ships, score it not only for its compatibility with existing DOS and Windows apps, but also for its compatibility (or lack thereof) with the myriad 32-bit OS/2 apps. And may the most compatible operating system win.

On December 20, a press release popped out of the OS/2 Magazine fax machine. Seeing the headline, "OS/2 Warp Worldwide Sales Exceed 800,000," we read this happy news eagerly, until encountering a quotation from Dan Lautenbach, vice-president of IBM's Personal Software Products division. "The customers who are buying OS/2 Warp right now are new customers—we know this because the upgrade to OS/2 2.11, the version of OS/2 that is predominant in the marketplace, becomes available in January," Mr. Lautenbach said.

Really? We believe it's a far less black-and-white scenario. Yes, plenty of corporate OS/2 2.x "full-pack" users decided to wait for OS/2 Warp 3.0 "full-pack." But our research shows that many OS/2 for Windows users, and more than a few OS/2 2.x "full-pack" users, bought OS/2 Warp "for Windows" right away.

The IBM spokesman who intercepted my call to Mr. Lautenbach flatly denied that OS/2 2.x users upgraded to OS/2 Warp "for Windows"—his proof was "feedback from our dealers and distributors." But when I picked up a copy of OS/2 Warp at CompUSA, no salesperson

asked if I were a new or existing OS/2 owner. (Considering that a Windows user contemplating OS/2 Warp is more likely to seek out assistance than an OS/2 2.x user grabbing an upgrade, a dealer's anecdotal evidence is naturally biased toward new customers.) In any event, we've heard from many OS/2 2.x "full-pack" customers who decided not to wait for OS/2 Warp "full-pack" and who are running OS/2 Warp "for Windows" with the Microsoft Windows they already own. Others upgraded to OS/2 Warp because they don't need Windows applications.

What about OS/2 for Windows users, many of whom upgraded to OS/2 Warp right away? The IBM spokesman said they're counted as new users since most purchased OS/2 for Windows because of its Warp upgrade coupon. That's hard to believe, considering OS/2 for Windows has been out since late 1993.

So, even when challenged, IBM stuck to its claim that the 800,000 OS/2 Warp copies sold as of mid-December represent 800,000 *new* OS/2 users. But then, the spokesman acknowledged that copies of OS/2 Warp provided free-of-charge to IBM employees upon request were probably included in that 800,000 sales figure. What else might that figure include? I don't know what to believe.

Of course, IBM, like other major companies, routinely plays fast and loose with such numbers. The IBM spokesman declared that, at the end of 1994, there were seven million OS/2 users. Great! But when I asked whether that represented seven million OS/2 *users*, or seven million *copies of OS/2 sold*, I was accused of "playing games." The spokesman finally admitted that his number *did* represent total copies sold, including upgrades, but he later repeated his boast of seven million OS/2 *users*. Again, what should I believe?

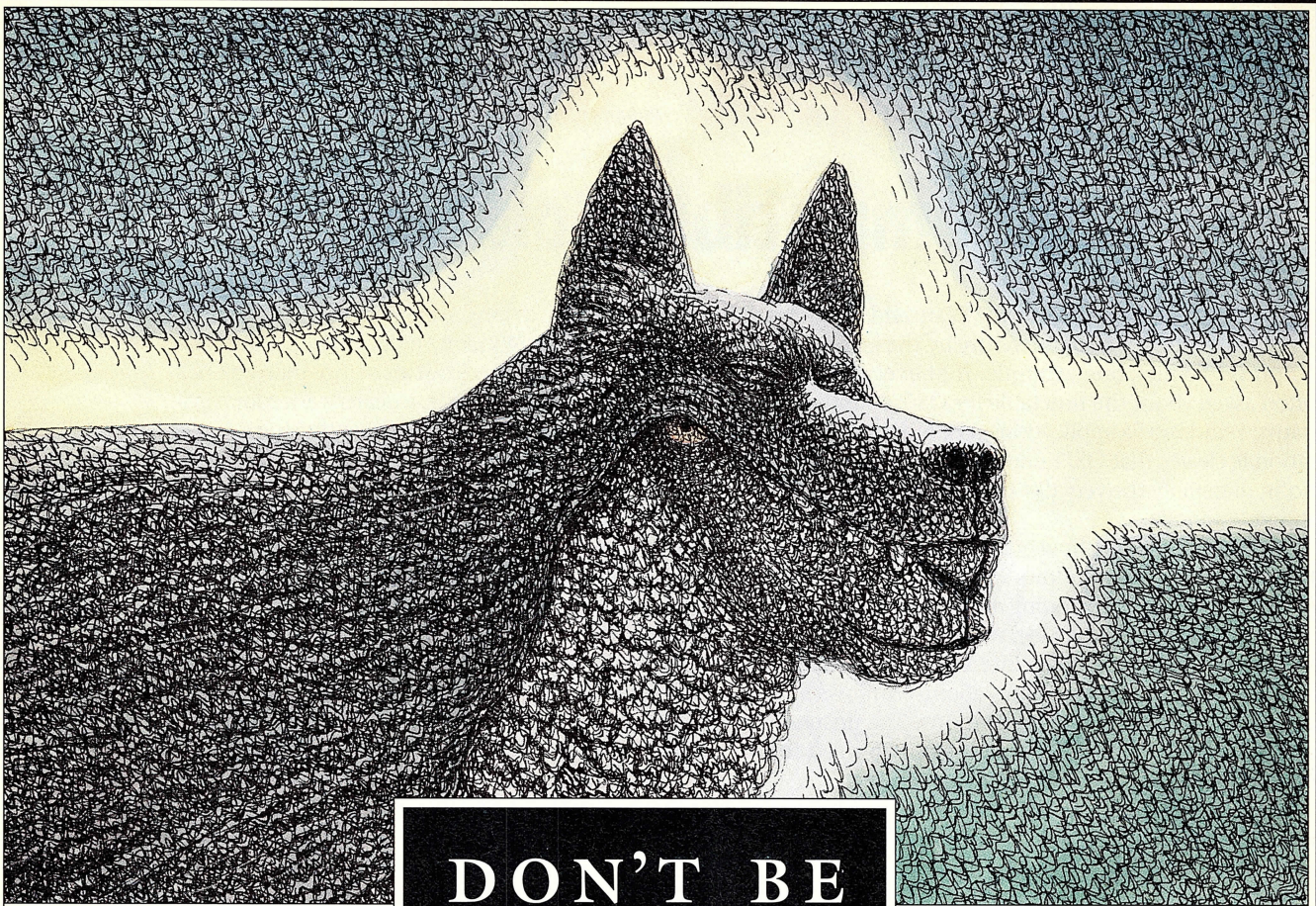
Now, I'm not naive. We all know that IBM is trying to make OS/2 look as successful as possible to entice software developers, sway journalists, impress Wall Street, attract or hold onto Fortune 1,000 customers, and annoy Bill Gates. Still, that's no excuse for promoting misleading or inaccurate statistics, or hyping unwarranted conclusions drawn from those statistics.

IBM will not improve OS/2's credibility as an alternative to Microsoft's Windows 95 and Windows NT by trumpeting specious claims that can't be—or won't be—substantiated.



Alan Zeichick
Editor-in-Chief





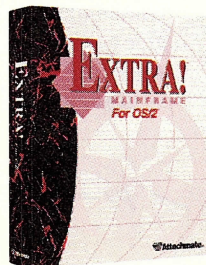
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Letters

UUPC for OS/2?

Dear Editor:

In your Internet feature in the November 1994 issue, Mr. Vaughan-Nichols claims that there are no UUCP programs available in native OS/2 form. However, a complete release of UUPC for OS/2 is available on the August 1994 Hobbes OS/2 CDROM. I have met at least one satisfied person who uses this program every day to obtain Usenet news and mail.

Dave Stubbs via e-mail

Mr. Vaughan-Nichols did overlook the UUPC/Extended executables 1.12b which are available in the /2_x/comm/ directory of the August 1994 edition of Walnut Creek's archived Hobbes CD-ROM disk. For those who are interested in obtaining the UUPC files and already have Internet access the same files are also available by ftp from either ftp.cdrom.com or hobbes.nmsu.edu sites.

—Editor

Where is the PowerPC 604?

Dear Editor:

I am still waiting for the PowerPC 604, but many are not. Quite a few people I know are switching to the Pentium. What I want to know is IBM going to make another marketing blunder with the 604, while Intel is capitalizing on the lack of market competition.

We all know OS/2 will run well on the 604, so why doesn't IBM release the processor that will probably deliver them from the financial peril that they are in. Or is the PowerPC 60x series just a dream?

The word is the Taiwanese have built clones ready to hit the market, so the problem is not availability. It is IBM's usual problem that they are trying to tell the industry what they want rather than listening to them to find out what they really want!

IBM, get your act together we want the PowerPC 604 with or without OS/2 for the PowerPC and we want it NOW!

Damien Cooke, Australia.

Indeed with the recent Pentium calculation problems the mind boggles over how well the PowerPC would have sold if it was out now.

—Editor

The Name Game

Dear Editor:

I disagree with several comments Alan Zeichick made in his editorial "The Name Game" in the Dec 1994 issue. I thought I'd voice them to you to see what you think.

I do not think the major operating system vendors are purposely delaying their products just to heighten pre-release hype. As a developer myself, I know that systems can be delayed for a myriad of reasons, and the more complex they are (ie. operating systems!) the more likely there will be delays. We are hitting Microsoft and IBM for every little bug we find in their operating systems, yet we are also upset when they hold back a product because more problems were found. I can completely understand that a major software package could be delayed over and over again because of bugs.

I also must deviate from the norm and admit that I like it when vendors announce their products months and months before the software is actually ready. It allows major organizations, especially governments, to plan ahead for things and to avoid needless in-house projects that will someday soon be solved by a major software vendor. The clients that I've worked for have never seemed to mind very much when products are delayed or announced prematurely, because invariably the client's own planning schedule is very far into the future anyway.

Daryl Kulak via e-mail

OS/2 Warp

Dear Editor:

I plan to buy a larger disk and partition it using the Boot Manager feature,

which I now have with OS/2 2.1. Does OS/2 Warp also have this feature? I plan to buy a stand-alone DOS (not sure what version yet). I do have problems with some DOS programs running under OS/2 and I've had difficulty getting MPM, Sound Blaster, CD ROM and Win-OS/2 to work with each other. I think that I will keep OS/2 2.1 because it supports Windows. According to the manual, I can have three systems under Boot Manager.

IBM also told me that Warp is not compatible with OS/2 2.1, because it is a stand-alone program, not an upgrade.

Vincent V. Gubitosi
via e-mail

The representative you spoke with must have been talking about the "Fullpack" version of Warp, which includes Windows functionality within Warp. That version should begin shipping any day now.

It appears that IBM has lowered their prices for direct orders. Warp has been discounted to around \$89 at most places since it began shipping anyway. The prices listed in the magazine are the "suggested retail price," and you can nearly always find products for less.

Warp also includes the Boot Manager. Again, I think there was some miscommunication with the IBM representative. You can certainly install DOS, OS/2 2.1, and OS/2 Warp in separate partitions and switch between them at boot time via the Boot Manager.

Brian Proffit

If you have any comments about OS/2 Magazine, send them to:

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2nd Quarter	\$472.78	10.86%
3rd Quarter	\$501.26	11.52%
4th Quarter	\$515.67	11.83%
Total for Canada:	\$1,909.18	43.87%
United Kingdom		
1st Quarter	\$543.75	12.50%
2nd Quarter	\$611.39	14.05%
3rd Quarter	\$597.99	13.74%
4th Quarter	\$689.12	15.84%
Total for United Kingdom	\$2,442.25	56.13%
Grand Total:	\$4,351.43	100.00%

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OpenDoc Sooner, Taligent Later

TWO OS/2 OBJECT STRATEGIES OFFER IMPROVED APPLICATIONS NOW, A PORTABLE OPERATING SYSTEM IN THE FUTURE. BY ALEXANDER ANTONIADES.



"If OS/2 is only 32-bit Windows, then it's over," said a consultant at fall Comdex in Las Vegas. That's the danger: It'll be hard for IBM to convince Windows applications users to use OS/2 Warp 3.0 once Windows 95 begins shipping.

Part of IBM's strategy to add value to OS/2 is object technology, Taligent and OpenDoc, in particular. These two projects IBM has helped to fund (see "Dateline: OS/2," October 1994) are finally starting to show results, and IBM is trying to get those results into OS/2 products as soon as possible. The plan is to deploy OpenDoc in the near term, and Taligent in the long term.

According to CI Labs, the company managing the OpenDoc standard, OpenDoc is easier to integrate into OS/2 and other operating systems because it is a protocol similar to Microsoft's OLE2 technology. One key difference: OpenDoc allows applications to talk to each other dynamically, so that they can exchange live data, as opposed to OLE2's bit-mapped representational links. CI Labs claims that OpenDoc will be supported on the Macintosh operating system and all versions of Windows (including IBM's Win-OS/2), as well as native OS/2.

Taligent, on the other hand, requires programmers to use a totally new paradigm. The foundation of the Taligent Application frameworks (now named "CommonPoint") is a set of cross-platform C++ object frameworks that form the foundation of all Taligent programs. These programs interact with each other and supposedly will be truly cross-platform compatible, requir-

There is some overlap between OpenDoc and Taligent, but the plan appears to be to use OpenDoc as a short-term strategy, with Taligent becoming more important in the long term.

ing only a recompile to run on other Taligent-supported platforms.

The primary investors in Taligent Inc., Hewlett Packard, Apple and IBM, have announced that all of their operating systems will support CommonPoint, and Taligent is also trying to work with Microsoft on 32-bit Windows support.

There is some overlap between OpenDoc and Taligent, but the plan appears to be to use OpenDoc as a short-term strategy, with Taligent becoming more important in the long term. Unlike Taligent, OpenDoc support should be easy to add to existing OS/2 applications: David Pollack, president of Athena Software, said they were able to create an embeddable spreadsheet "OpenDoc part" by adding only 500 lines of code to their Mesa-2 spreadsheet program.

The problem with Taligent is that,

because it's a complete application framework, true Taligent-compliant applications need to be written—or rewritten—from the ground up using CommonPoint.

According to IBM, OpenDoc will be integrated into the next major release of OS/2. At a Comdex OpenDoc forum hosted by IBM, their director of object technology, Cliff Reeves, announced that OpenDoc for OS/2 will be finished late in the first half of 1995. The next version of OS/2's Workplace Shell, currently slated for the fourth quarter of 1995, will add OpenDoc parts, including an OpenDoc version of the BonusPak. Initially, OS/2 will be partly accessible from OpenDoc.

On the Taligent side, a CommonPoint developer's kit will be available for OS/2 in mid-1995. The Taligent Development Environment, demonstrated at Comdex, should be available by the third quarter of this year.

It hasn't been announced whether CommonPoint for OS/2 will be bundled along with OS/2 itself, or will be a separate product. One big question seems to be CommonPoint's memory requirements: Currently, Taligent engineers are estimating an additional 6 to 8 MB RAM above OS/2's own requirements.

It's interesting to note that both OpenDoc and Taligent originated at Apple. It appears that Apple and IBM are jointly developing and sharing increasing amounts of object technology. If this trend continues, we shouldn't be surprised to see both Apple and IBM selling what will basically be variations of an OpenDoc-

compliant Taligent operating system running on a PowerPC in the not-too-distant future.

OS/2 for the PowerPC goes into beta

IBM's first attempt to port OS/2 to a non-Intel-based platform has finally entered the beta stage. At least 150 developers were shipped the OS/2 for the PowerPC beta running on PowerPC 601 machines in late December 1994 and early January 1995. While this beta contains a full Workplace Shell, many of the applets and other operating-system functions, such as multimedia and network support, won't be available until the second beta release, expected later in the first quarter of 1995.

Early comments from beta testers were mixed. They praised the look of the early PowerPC hardware, which not only doesn't switch into character mode once during bootup, but doesn't even show the OS/2 logo, and simply

boots into the Workplace Shell. However bootup time is longer than five minutes, and the resulting operating system wasn't very stable. But according to IBM, OS/2 for the PowerPC is on track to be finished by mid-1995.

Conspicuously absent are the other parts of the Workplace OS strategy, as OS/2 for the PowerPC used to be called, that IBM talked about in 1993 and early 1994. Apparently OS/2 for the PowerPC does run on Mach microkernel, but Microsoft and Apple have both balked at having their latest operating systems as "personalities" under OS/2 for the PowerPC, the way that Windows is emulated using Win-OS/2.

Warp OS/2 full-pack goes into gamma

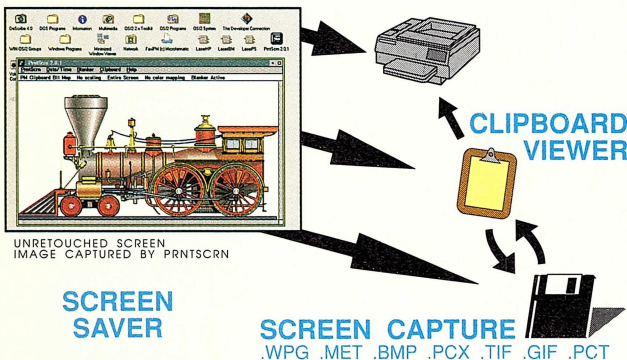
The version of Intel-based OS/2 Warp 3.0 that includes Win-OS/2 (often nicknamed "OS/2 Warp with Windows" or "OS/2 Warp full-pack") went

into gamma-testing in late 1994, and might be shipping by the time you read this article. The name of the product? As of press time, IBM spokesman said that the product will be called "OS/2 Warp version 3 with Windows Support." What's the main difference in packaging between this product and the existing OS/2 Warp "for Windows?" A different-colored box.

One controversial decision at IBM's Personal Software Products division is to limit the bug-fixes in OS/2 Warp full-pack, in order to keep the source code and behavior of both OS/2 Warp versions as similar as possible. We should expect a "service release" for both versions of OS/2 Warp a few months after the full-pack version ships.

OS/2 Warp with Windows Support has been announced to have a suggested retail price of \$199 in the United States; the street price is expected to be around \$130.

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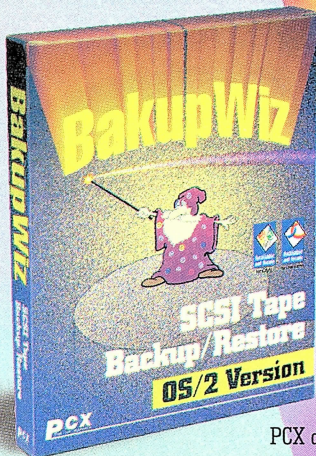
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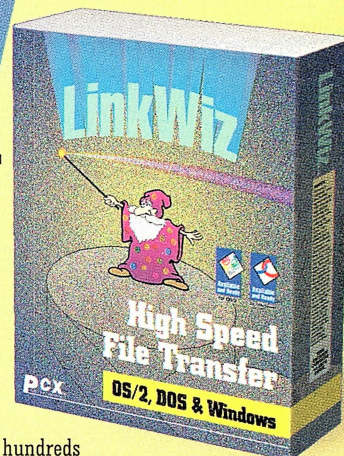
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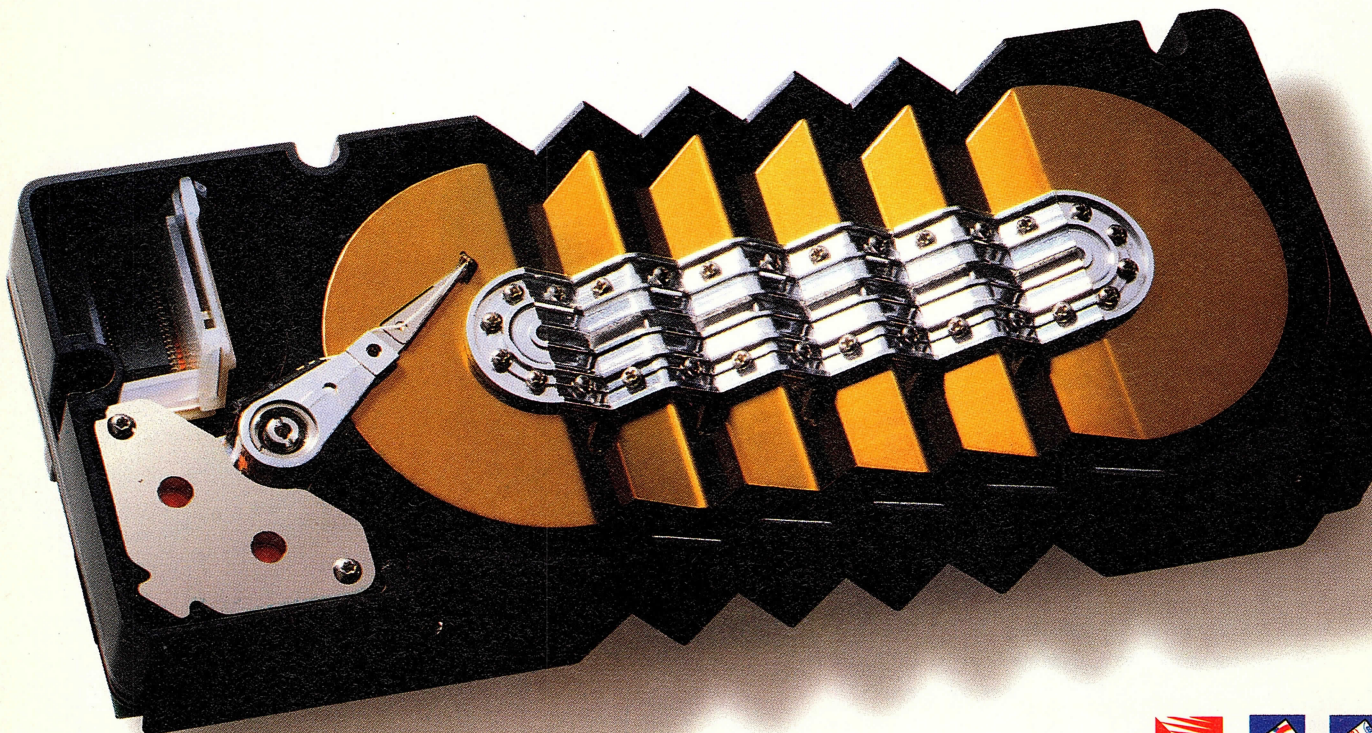
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The Changing Definition of Portability

INTEROPERABILITY MEANS YOU *CAN* TAKE IT WITH YOU BY AMY D. WOHL



Before I confuse you utterly by flinging around half-a-dozen different definitions (past, current, and future) for the term portability, let me make one thing perfectly clear. No matter how you define the word, *portability* is a good idea. It makes desirable functionality available anywhere, regardless of where its design or implementation was originally initiated.

The easiest kind of portability to understand is the physical type. In other words, can I carry something from place to place? This kind of portability depends on lightweight rugged design that withstands jostling and an ability to function well in stand-alone mode without the need for other tools, accessories, or systems and perhaps without even the need to plug it in. As computers become more physically portable, downsizing from the 30-pound luggables of yesteryear to the sleek four-pound subnotebooks of today and one-pound-plus personal assistants of tomorrow, the concept of portability is constantly being revised.

Today, however, people are more interested in software portability than they are in simply being able to move hardware around. Platforms and cross-platform migration schemes abound. The entire impetus behind the popularity of UNIX (particularly in communities like the Federal government) was the notion that it was portable from one hardware platform to another, which it is and isn't. Many varieties of UNIX exist, each slightly different than the other.

But, information systems professionals and users often use the word portability in yet another way—as a

**People are
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kind of code word for "open systems." Unfortunately, mention of the term, "open systems" starts a very messy discussion. Half-a-dozen acceptable (and different) definitions of it exist, ranging from *de facto* (marketplace) and *de jure* (institutional) standards, to published specifications and interoperability. I can, however, bring you the results of several surveys of user organizations that produced uniformly consistent results.

Users sometimes think of the terms "open" and "portable" in terms of UNIX or a *de facto* standard, such as DOS or Windows, but nearly 100 percent of survey respondents in several surveys agreed that it was interoperability that they actually had in mind. I also found it useful to cross check with other consultants and researchers. I learned that they, too, had found that what users were looking for was interoperability.

When we asked users why they wanted to achieve interoperability, the answers ranged from highly technical

ones to very straightforward ones, but all could be reduced to the simple statement: easy access to data and information. The technical term for this ability, in case you want to be unusually elegant, is "transparent interoperability," which means interoperability that is so seamless it's invisible. The user doesn't notice that he's connected to and is receiving information from another system—Bill Gates' "Information at Your Fingertips," but your fingertips can stretch out and get their information from anywhere.

Portability would let you move software from one hardware platform to another. Interoperability, in a sense, makes portability irrelevant. It allows you to leave existing software and data in place (legacy systems, perhaps) and access them from new client/server systems without having to get everything onto common operating-system platforms and rewriting a zillion dollars worth of software.

Interoperability lets you run applications on their optimal platforms (palmtops, notebooks, desktops, servers, supercomputers) and use interoperability to smoothly access the information that any particular application might require. I can make investments in software without worrying about the future of a particular platform because I can always interoperate between my current environment and future environments.

The key to this kind of portability is the use of standards that support it. Communication sessions could then be set up, databases would support queries from foreign environments, and the complexity of these processes would be masked from users and local systems

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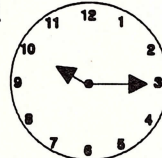
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For interoperability to work, vendors have to sign up for institutional standards or be forced to support *de facto* ones, which is where the conflict comes in. Microsoft, as a *force majeure* in the marketplace, prefers *de facto* standards set largely by their own products (they would argue that they are set by the success of these products in the marketplace). Other vendors, particularly systems vendors, for example IBM, HP, and Digital, are more accustomed to the gentle art of setting institutional standards through compromise, but this process often takes longer.

It is likely that most major software developers will embrace both *de facto* and institutional standards to appeal to the broadest possible audience and offer the most interoperability for their products. Unfortunately, broad interoperability doesn't necessarily equate with greatest transparency. The most transparent and seamless interoperation will probably occur only for vendors who choose to focus on a narrower spectrum of issues and platforms. Trying to be everything to everybody in a market where everyone makes changes on at least an annual basis is an impossible challenge.

What should a user do?

Look for products and vendors that stress interoperability at the level you need. For technical users, breadth or depth might be more important than ease of use. For end users working in thinly supported remote workgroups, nothing is more important than ease of use at every level from installation on.

OS/2 users must be particularly careful to look for software vendors who provide support for OS/2 servers and (if you support them) OS/2 clients. Thankfully, with the increasing success of OS/2, the number of mainstream vendors is becoming larger every month.

Amy D. Wohl is president of Wohl Associates, a consulting firm specializing in office information systems, personal computing, and end-user computing. She is also editor of the Trendsletter, a monthly newsletter on computer industry trends.

Where IBM Needs to Improve with OS/2

IBM'S MARKETING LITERATURE FAILS TO SUPPORT THEIR TRUE COMMITMENT TO OS/2. BY WILLIAM F. ZACHMANN



Thanks to Warp, OS/2 has made substantial progress during the last year. Although it is still underrated and somewhat neglected by the trade press, OS/2 is used considerably more broadly and is more widely appreciated by the people who really count—the people who use personal computers—than it was a year ago. Even Microsoft Chairman, Chief Executive Officer, and bitter enemy of OS/2, Bill Gates, has finally admitted (albeit grudgingly) that OS/2 is a force to be reckoned with in the marketplace. OS/2's enthusiastic partisans, on the other hand, have pointed to OS/2 Warp's success as evidence of sure victory in the end for OS/2 versus the forces of Windows Everywhere.

The truth, however, for the moment at least, remains somewhere in the middle. OS/2 is certainly doing better than ever and better than the consensus had anticipated, but it is as premature to celebrate victory for OS/2 today as it would have been to mourn its much publicized death two years ago. Despite substantial gains in the last year, OS/2 has a very long way to go against rough competition. In addition, OS/2 has some obstacles of its own to overcome. IBM has plenty of room for improvement on OS/2.

OS/2's success ultimately depends not only on how well Microsoft delivers on its promises for Windows 95, Cairo, and so on, but on how swiftly and how well IBM improves its commitment to OS/2 and its marketing. IBM can win by doing a better job than Microsoft does to provide an operating system that meets customers' real needs and by solidly backing their operating system. IBM cannot win, howev-

er, without significant further improvement to its commitment to OS/2.

OS/2's success will depend on whether IBM as a whole can support OS/2 as a company-wide strategic effort. While progress has been made toward this end, it has been painfully slow. Much work remains to be done. Foot dragging by the IBM PC Company, IBM PC Direct's sales effort, and (perhaps worst of all) IBM's Power Personal Systems Division, which is responsible for the IBM PowerPC effort, have been allowed to continue far beyond what IBM management should tolerate.

Mailings sent out as recently as last November and December clearly showed that the three divisions were finally showing signs of getting on board with IBM's corporate efforts on behalf of OS/2. However, they were still doing so with minimal effort, which belied the claim that they were truly committed to IBM's overall OS/2 strategy. A major German vendor, Vobis, was making firm commitments to pre-load OS/2 on its systems while the IBM PC Co. was doing barely more than beginning to list models to be shipped with OS/2.

An IBM PC Direct mailing that was sent in late November finally mentioned OS/2 Warp (despite the fact that it was printed on the same page that offered Intuit Quicken for Windows, WordPerfect 6.0a for Windows, and Lotus 1-2-3 for Windows in a "Super Value: Office Value Pack"). It did not emphasize Microsoft Windows as prominently as earlier mailings had done and gave OS/2 LAN Server equal time (along with Novell Network, Windows NT, SCO UNIX, and Banyan

Vines) on the pages for the IBM PC Server 300.

These efforts, however, hardly conveyed any real commitment to OS/2. The OS/2 Warp ad got no more than one-sixth of a page that was otherwise devoted to Windows applications. The entire facing page that featured the Lexmark WinWriter printer read: "Lexmark and Microsoft joined forces to create a unique family of laser printers specially designed for optimal Windows performance." An IBM PC 300 system was, in fact, pictured with an OS/2 Warp screen, but on the next page the IBM ValuePoint Performance Series system was pictured running Windows.

Worst of all, in the entire 16-page catalog they didn't once mention whether OS/2 was offered preloaded on any of the 21 listed systems. Every system, except for the two server models, was listed with DOS and Windows preloaded. The two server models appear not to include any software in the basic package, although NetWare 3.12 (five user) with DOS 6.3 or OS/2 LAN Server v.3.0 Entry with OS/2 2.11 are offered as extra-cost options for \$605 and \$615 respectively.

The bottom line is that, although the IBM PC Direct catalog does not thump the tub as blatantly or as enthusiastically for Microsoft Windows as earlier versions did, it hardly constitutes a statement of significant support for OS/2 by IBM's own direct-marketing organization or by the IBM PC Co. If OS/2 is, in fact, a strategic effort on the part of IBM as a whole, I certainly could not tell by looking at the IBM PC Direct catalog that was mailed well over a month after the release of OS/2 Warp. The operating system software that was offered for sale

by IBM PC Direct that came bundled with the IBM PC Co. systems remained DOS and Microsoft Windows—not OS/2.

The situation worsened with the release of the "IBM Power Personal Developer's Guide." The guide was mailed to software developers and systems houses by the IBM Power Personal Systems Division (at about the same time that the IBM PC Direct catalog was mailed), promoting the IBM Power Personal Developers ToolBox Program. Similar to the IBM PC Direct catalog, it makes a superficial show of giving equal time to OS/2 for PowerPC alongside IBM's AIX, Sun's Solaris, and Microsoft's Windows NT for PowerPC.

If you dig into the substance of the mailing, however, it becomes clear that IBM is still showing more support and enthusiasm for Windows NT for PowerPC from IBM's PPSD than for OS/2 for PowerPC. The check-off boxes on the business reply card that is detachable from the back cover of the brochure tell the story clearly. The first choice on the card reads, "Yes, please rush me my IBM

Power Personal Developer's ToolBox Program Enrollment Application Kit." The second says: "I am currently not interested in writing applications for AIX or Windows NT, but would like to write applications for ☐ OS/2 ☐ Solaris (Please check the appropriate boxes). Please send me an Enrollment Application Kit at the appropriate time."

Both the IBM PC Direct catalog and the IBM PPSD Developers brochure appear to reflect a superficial responsiveness to pressure from Armonk not to behave as blatant supporters of Microsoft as they have done in the past. Both evidence a certain concern about being "politically correct" by at least appearing to give equal time to OS/2. Both, however, still reflect objective policies that continue to fall far short of any real support for OS/2 or of IBM's strategic commitment to OS/2 and show instead continued support for Microsoft Windows and Windows NT.

IBM's external competition from Microsoft is tough enough. IBM snoozed through the late 1980s while Bill Gates and company stole the desk-

top operating system software market away from the sleeping giant. IBM has a terrific product with OS/2 and a decent opportunity to recapture the territory that they allowed to slip from their fingers while they slept. They will not do so, however, by tolerating what amounts to outright insubordination by the quislings of the IBM PC Co. and the IBM Power Personal Systems Division. If Lou Gerstner really wants to win with OS/2 and recapture the territory that his predecessors so foolishly and so heedlessly gave away to Microsoft, he needs, promptly, once and for all, to put an end to any further sabotage of OS/2 by IBM's own internal divisions—and do it now.

Will Zachmann, a well-known computer-industry analyst, is the founder and president of Canopus Research, based in Duxbury, Mass. He is also a former vice-president for corporate research of International Data Corp. You can reach him on CompuServe at 76004,3657, or on his popular CANOPUS forum.

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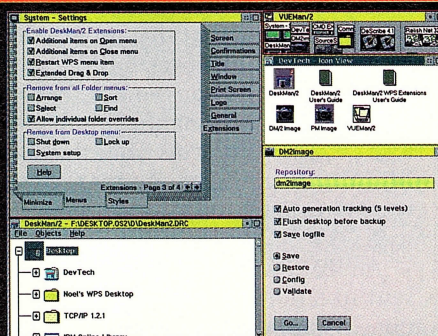
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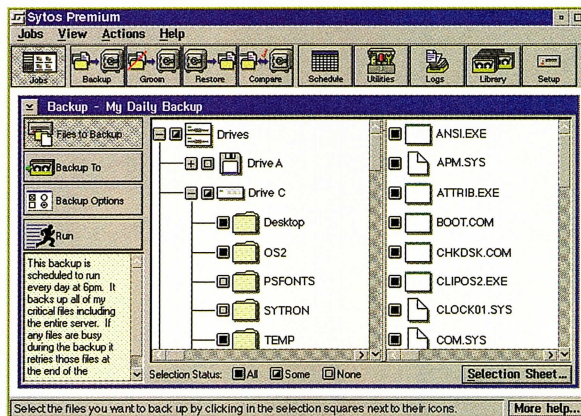
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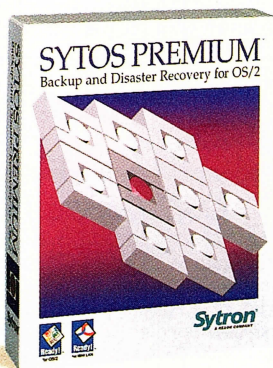


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Page Turning Notes

LOTUS NOTES 3.2 AND MAGUS PAGETURNER 1.0.1. BY BRIAN PROFFIT



Lotus Notes 3.2

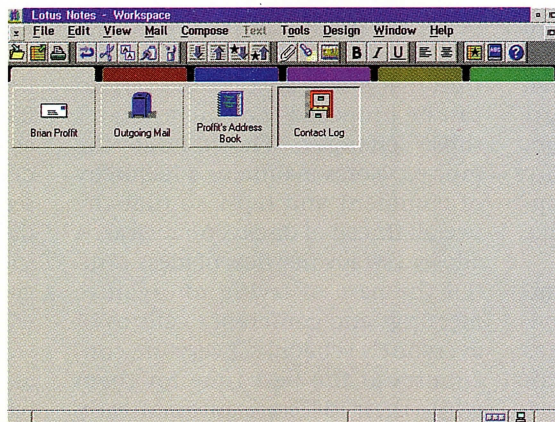
The acknowledged patriarch of groupware just got better. Lotus has released an upgrade to Notes. The new version is available for OS/2, Windows, Windows for Workgroups, UNIX, and Macintosh System 7.

At its essence, Notes is really a freeform database product. Without the more detailed concerns of other database products, Notes makes it easier for almost anyone to develop data-driven programs. That's really where the focus is with Notes—on the forms that you use to access and manipulate the data, instead of on creating sophisticated tables.

WYSIWYG Application Development

Notes feels more like an application generator than a database. You lay out the forms through which the data is presented, simply by painting the words on a blank form. You have strong control over the color, font, size, and position of all aspects of your form. Of course, you don't have to start from scratch. Notes includes many templates that provide good starting points for many different types of applications. And because the corporate environment is the target audience, Lotus has included a very good customer-service application that should aid MIS help desks in the resolution and tracking of problems.

Literally dozens of built-in commands allow development of more detailed programs. It is a Lotus product,



so naturally you get to do things with the use of "@" commands. Despite their non-intuitive nature, these commands do provide a lot of functionality. In addition to the standard things like range checking (for example, making sure a month number is in the range from 1 to 12), you can force a data value to be one of a list of items. By taking advantage of the graphical interface, Notes can present that list as a set of radio buttons—or check boxes if more than one choice can be selected. This function can be accomplished via simple instructions to Notes. The developer doesn't need to drag and size the graphical controls onto the form.

Instead of being composed of "records," Notes databases are made up of "documents." I'm not just pointing out an idle terminology nit, it's a difference in perspective. For example, Notes includes a spell checker. Data can go beyond normal text and numbers to include "rich text." Rich text fields can include changes of font and color and

can contain embedded objects such as sound clips, pictures, or full-motion video. Files can be attached to documents and attachments can even be stored in a compressed form to save disk space.

Sharing your data

It is quite easy for people to share this information through a Notes server. Users can reach the server, either through a network or via dial-up modem connection. Dial-up connections

seem noticeably faster with version 3.2.

Of course, you don't have to be attached to the server to access the information. Notes allows users to create database replicas on their local systems. They can then query, add to, and update that database on a totally stand-alone basis. Then, when desired, they use Notes' Replicate function to send their new records to the server, receive new records from the server, and have their updates and those of other users automatically merged. This feature is very powerful, particularly for those who work at home in the evenings or travel frequently.

It's easy to set up multiple views in a database so that the information can be accessed in the manner most suited to a particular task. Not all views are available to all users, however. Notes includes extensive security features to control access to databases. Multiple security levels allow precise control over who can read, copy, add to, or change the format of databases.

One feature THAT REALLY SETS NOTES APART IS ITS FUNCTION AS AN E-MAIL VEHICLE.

OS/2 Exploitation

Lotus has added a fair amount of OS/2 exploitation since version 3.0 was released, including better use of multiple threads to speed processing. Database replication, for example, can take place entirely in the background. However, printing could still benefit from a better use of multithreading.

Lotus also made it easy to set up associations between databases and Notes itself so that database files can be double-clicked directly to start Notes. It is still a Lotus application, though, so expect a huge memory footprint with corresponding swapping increases and performance decreases.

For speed, Lotus strongly recommends using the OS/2 Server version, but a Windows server is available as well. Windows clients can access an OS/2 Server and vice versa.

More than a Database

One feature that really sets Notes apart is its function as an e-mail vehicle. Not only can mail be exchanged with others who are registered to the Notes server, but it can also be sent through Vendor Independent Messaging (VIM) gateways to outside services such as the Internet. Notes is commonly used as a news-clipping service. The server can keep up with news sources or financial services, filtering through them based on predefined criteria, and making up-to-the-minute information available to clients.

The essence of the groupware title, however, signifies more than the ease of sharing information. Another unique feature of Notes is its support for "discussion" databases. As more companies organize their projects into workgroups to focus the effort and improve productivity, finding an easy way for the group members to communicate becomes critical. It's not uncommon for group members to be in different locations

(and different time zones) either.

A discussion database allows group members to conduct an on-going discussion, similar to that on computer bulletin boards. Unlike a BBS, though, Notes makes it easy for ideas to be organized. For example, one member of the group can post a document that makes an initial proposal. Each member of the group can post responses and suggestions that stay associated with that proposal. A second version can be proposed that incorporates those changes. Throughout the process, Notes maintains a hierarchy of comment and reply so that the overall thread of discussion is clear. It allows a steady free flow of ideas without the pain of trying to organize meetings and conference calls to fit everyone's schedule. Everyone contributes at the best time for them while their ideas are automatically merged into the overall database.

Entry-level version available

Not everyone needs the full power of Notes—particularly the customized databases. For that reason Lotus has introduced a new product with version 3.2 called Notes Express. Express is a client-only product and is restricted to discussion, mail, phone-book, reference, and news databases, though you can have as many as 80 databases that are made up of these types. Notes Express clients can only connect to Notes 3.2 servers.

Glee or flee

Other than adding support for Notes Express, the improvements in version 3.2 are primarily bug fixes. These bug fixes, however, are extensive and make the upgrade worthwhile.

If you are trying to create some data-management programs of your own, Notes is certainly a simpler way to get started than mastering SQL databases. At \$495, however, it isn't a product for

the casual user. Notes Express may cause a new flood of corporations to use Notes, however, with a new price of \$99 each for the first 100 clients.

Magus PageTurner 1.0.1

You just received a file with a .ps or .eps suffix. What do you do with it? PostScript (and its abbreviated form, Encapsulated PostScript) is a file format that has become the *de facto* standard for publishing. It allows text, graphics, colors, spacing commands, and even rotation of text and graphics—all of the pieces required for a professional publication—to be embedded in a single file. In fact, PostScript isn't a "format" as much as it is a language. The output device, whether it is a printer, a typesetting machine, a digital photo production system, or any of several other special devices, reads the file and executes the commands it finds there to create the final image. And, because it is a language, PostScript files can be created by nearly all operating systems, which makes it easy for you to share detailed documents with people who are using Windows, Macintosh, UNIX, or even mainframe systems. (Note: PageTurner can handle the EBCDIC code generated by host systems.)

It doesn't sound like it applies to you? Now that you've got your shiny new Internet Access Kit, you may be surprised to find that a lot of the information on the Internet is stored in PostScript form precisely because of the ability to use those files on any operating system. If you have a PostScript printer, you can simply print the PS files directly. But if you don't, how are you going to look at those files? PageTurner is a good answer.

No PostScript printer required

PageTurner loads PostScript documents into an OS/2 window with a full-color WYSIWYG display. From there, you can page through the document, jump to a specific page, or print the file—even if you don't have a PostScript printer.

How to Cruise the Internet Without Being Taken for a Ride.

All Internet Providers Are Not The Same.

It seems as if every Tom, Dick and Harriet has decided to jump on the Internet bandwagon. Once they find out it is a simple matter of buying a computer and linking it to the net, they hang out their shingle and proclaim, "We are the Internet."

Well, unfortunately, this is not the case. You can get burned by not asking a couple of questions before signing up with a particular provider.

What Type of Links Do you Have?

Do they have multiple high speed links to the Internet (T1 or better)? Is there redundancy built in, by using multiple backbone providers for the links? How many total subscribers are there? A T1 (1.44 mb/s) will handle about 100 concurrent dial-up (14.4 kbps) users before degradation of response time becomes noticeable. At **PING** we have multiple T1s to the

Internet and add more as we grow. We are currently using three different backbone providers in order to provide redundant links.

What Software Do You Support?

Most companies won't provide **any** software support! They believe that it is **your** responsibility to get your software installed and configured

properly, even if you're not sure what software you require. Another important bit of information is their customer support hours.

Just because they are open from 9 to 5 doesn't mean your computer will accommodate you by breaking down during regular business hours.

PING provides 24 hour toll-free customer support on **all** software packages. In fact, we have most of the standard packages on our customer service PCs. Our personnel are familiar with OS/2® V3, Internet in a Box™, TCP/Connect II®, Reflection®, MacPPP, InterSLIP, Eudora, LINUX, SunOS and

many more. If it uses TCP/IP, we probably have it in house already configured.

What Will It Cost Me?

Most companies have a pricing structure that charges more for SLIP/PPP than for shell or UUCP accounts.

At **PING**, we standardize pricing for all three services. We offer nationwide connectivity through a toll-free dial-up line (at 9 cents a minute, it is cheaper than long distance alone), it includes mail and usenet news (over 10,000 groups) at no additional charge.

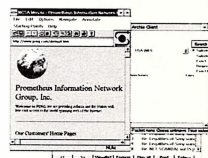
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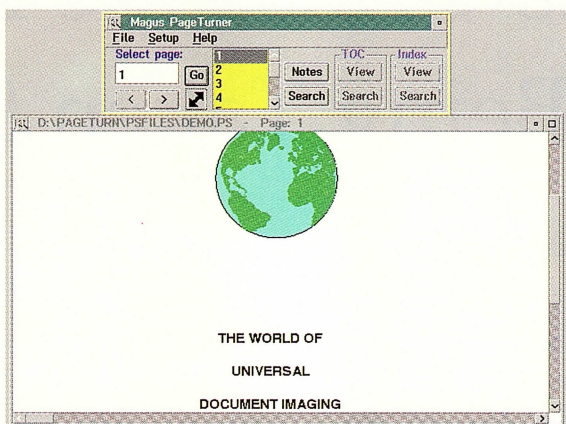
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Test Drives

PageTurner, however, is very s.l.o.w. You can expect a sizable delay when printing to a non-PostScript printer. One 11-page graphical document took longer than an hour to print on a 25MHz 386 with a non-PostScript HP LaserJet. Text-only documents and faster computers make a big difference, but it still isn't snappy under the best of circumstances. After that long delay, though, the results were really excellent. Multiple fonts, detailed graphics, and dithered shading of colored objects were all rendered beautifully.

Of course, a lot is going on in converting the PostScript commands to a bitmapped image of the page that can be passed to your OS/2 printer driver. The same problem occurs when you first load a PostScript file into the viewer. A lot of computing must take place before the document can be seen. I'd like to see more exploitation



of OS/2 in this area. As soon as the first page is constructed, I'd like to see it displayed. Subsequent pages can be built using separate threads, so I don't have to wait until the entire document is complete before looking at it. Because of the way PostScript files are structured, that can be a challenge. But that is the kind of responsiveness

that OS/2 users expect, and OS/2 can deliver.

After you've viewed a file, you should save it instead of simply closing it. PageTurner inserts some instructions of its own that won't affect how the document displays or prints, but that will greatly speed up processing the next time the document is loaded into PageTurner.

Installation snafu

During installation, I tried to tell PageTurner that my existing OS/2 font files were on the c: drive, but I wanted PageTurner installed on the d: drive. PageTurner kept insisting that there wasn't enough space on the c: drive for the installation. But the only thing PageTurner installs in the font directory is a 6,999-byte script that is used to define the installation process. The c: drive had

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plenty of room for that file. When I instructed PageTurner to display disk space, it insisted that I point the font files to the *d:* drive as well—where it failed to find my OS/2 fonts.

When I cleared enough space for PageTurner on the *c:* drive, it allowed me to install on *d:* successfully.

Lots of bad PostScript files

You may be tempted to blame PageTurner when different pages of a document overlap on the screen. Not that this program is without bugs, but this problem often occurs because the person who created the file used Encapsulated PostScript (EPS) when they shouldn't have. The EPS format was designed as a shortcut for single-page documents or clip-art that will be pasted into other documents. Unfortunately, many people use it for multiple-page documents. Since EPS doesn't include commands to indicate the end of a page, PageTurner may mangle information from different sections of the document.

The confusing part is that the file may well print correctly, because the printer (knowing what paper it has and what its limits are) may insert page-eject commands automatically. Actually, PageTurner might try to simulate this approach internally. It would be a kludge, however, and not part of the PostScript rules. Magus would have to effectively print the entire document to disk first, which would cause even more delays. They have indicated that their resources are better spent on improving the product in other ways, and I agree. In the meantime, I suggest that you encourage the person who created the document to use PostScript instead of Encapsulated PostScript.

Complete document imaging

It would be incorrect to think of PageTurner strictly as a PostScript file viewer or even as a utility for printing PS files on non-PostScript printers. Magus is trying to create a complete document-imaging system. As such, some additional features make it easier for you to work with your documents.

First, PageTurner includes a text-search function. Remember, these

Windows Test: WinFax Pro 4.0

Delrina's fax software has long been a best-seller for Windows users. Many OS/2 users would like to take advantage of its functionality, but unfortunately some problems have occurred when running with the default OS/2 settings. (Yes, I know that FaxWorks comes in the OS/2 Warp Bonus Pak, but it doesn't automatically configure itself as a printer option for your Windows applications and it isn't as full-featured as WinFax Pro.) You may be disgruntled at having to manually modify some settings to get WinFax Pro to work properly, but you can take some satisfaction from the knowledge that it doesn't display faxes at all under NT 3.5!

WinFax is in Warp's migration database and it gives you a head start in making these setting changes:

EMS_MEMORY_LIMIT	0
COMMON_SESSION	ON
KBD_ALTHOME_BYPASS	ON
VIDEO_8514A_XGA_IOTRAP	OFF
VIDEO_SWITCH_NOTIFICATION	ON
DPMI_MEMORY_LIMIT	64
IDLE_SENSITIVITY	100
COM_HOLD	ON
IDLE_SECONDS	30
VIDEO_RETRACE_EMULATION	ON

I suggest that you also make the following changes:

HW_TIMER	ON
INT_DURING_IO	ON
IDLE_SECONDS	60

If you have difficulty installing WinFax Pro and you're using the SIO communications device drivers, replace them with the COM drivers that came with OS/2 while you install WinFax. After installation, you can switch back to the SIO drivers. You may also need to install a fix that is available from Delrina. If you are on CompuServe, download *wfx304.zip* from Delrina's forum. Otherwise, contact Delrina at (408) 363-2345 for the fix.

aren't files that you can simply load into your text editor or word processor and scan normally. PostScript files are instructions for creating document images. The search function allows you to quickly zero in on the particular part of the document that interests you. You can also search across multiple files to find the specific document that contains the information you are seeking. One of the advantages of a paperless office is that you don't have to try to remember which document you need, which file cabinet you stuck it in, and whether somebody else has that folder. Just do a search across all of your documents for a list of those files that contain the text in question. When you select a file, PageTurner will automati-

cally load it and display a list of the pages in the document that contain the text you are searching for.

You can also annotate documents, adding any comments that you would like attached on a page-by-page basis. These won't print, but can be recalled on the display. Think of them as sticky notes attached to a page.

You can change the page number as well—well, sort of. For display purposes, PageTurner refers to each page by its sequential number, starting at 1. In the document itself, though, pages may be numbered quite differently. It is common to use Roman numerals for the first part of a document (like the table of contents), so that the page that has the number 1 at the bottom

Test Drives

may actually be the fifth physical page. PageTurner allows you to insert instructions into the document so that you can refer to the pages by the numbers that are printed on them instead of their strict sequential numbers. This feature also allows you to define the pages that comprise the table of contents and the index so they can be jumped to and/or searched directly. You can save this information with the file so that it is used automatically when read by PageTurner in the future. (Authors should note that they can do this before distributing their document to simplify processing by PageTurner users.)

Glee or flee

Corporate MIS departments may consider PageTurner a starting point on the path to a paperless office. If all internal documents are created as PostScript files, they can be stored and viewed in that form without any need to print or scan them.

Clearly, though, PageTurner is a special-purpose utility that is of no use to the many people who will never work with a PostScript document. People who surf the Internet often, though, may find themselves with quite a few PostScript files. PageTurner provides an excellent means of viewing and printing those files, even if you don't have a PostScript printer.

One caution, though. As of this writing, PageTurner does not work correctly on OS/2 Warp. A partial fix is available, however, and a complete fix should be in place by the time this review reaches you.

Brian Proffitt has been in the computing industry for 20 years. He was part of IBM's OS/2 team, left IBM to become the director of PC Week's Corporate Labs, and is now the president of Visionary Research. Brian is the author of two books on OS/2, is a contributing editor for OS/2 Developer and Senior contributing editor for OS/2

Magazine. He can be reached on CompuServe at 75300,1466, or Internet 75300.1466@compuserve.com.

RESOURCES:

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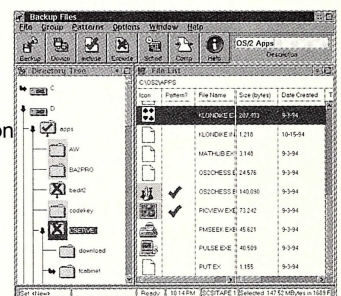
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How to shop for the perfect OS/2-friendly notebook or sub-notebook computer

BY
DAVID MOSKOWITZ
AND
ALAN ZEICHICK.





OS/2: On The Go

The first modern DOS laptops included obscure offerings like the Data General One, the first battery-powered DOS PC to use a full 80x24 display. Another pioneer was the Grid Lite. It had DOS in ROM, 1MB RAM for DOS and another megabyte for expanded memory. It had a 720K floppy, handy built-in modem, and big clear high-contrast monochrome LCD screen. Best of all, it only weighed about a dozen pounds, once you included the spare battery, charger, case, extension cord, and floppy disks. This was real portable computing!

If your current portable is of the same non-OS/2-compatible vintage as the Data General One or Grid Lite, or if you don't have a notebook PC at all, here's how to pick the right one. Let's not settle for mere OS/2 compatibility—we're glad to report that OS/2 compatibility is easier to find than ever. Let's work towards OS/2-friendly.

Basic needs

You should answer this question before you start shopping: Why do you want to get a portable PC, anyway? Do you need a portable office that can do anything a desktop computer can do, or a more limited PC that is merely capable of checking electronic mail or sending files to your company's local-area network? Do you need a self-contained PC that can make attractive public presentations (including full multimedia), or is the ability to connect to an external display sufficient?

There are basically two types of portable computers—notebooks, which weigh about six or seven pounds, and sub-notebooks, which weigh about four pounds. (Since portable-computing terminology is rather vague, we'll use the term "laptop" interchangeably with "notebook" in this article.) While a couple of pounds might not seem like much, the weight can make a difference during a week-long cross-country voyage. The reason for the difference in weight is the difference in features. Sub-notebooks typically do not include a floppy drive, have small displays, a non-standard-sized keyboard, and offer limited expandability (usually a single Type II PCMCIA slot). Notebooks generally include a floppy disk, nearly full-sized keyboard, and a couple of Type II PCMCIA slots that will also accommodate a single thicker Type III card.

If the portable computer will be your only computer, to be used at home and on the road, shop for a full-featured notebook computer that can function as a portable office (these machines are

often called "desktop replacements"). If you need a high-performance computer (for example, if you're an engineer or software developer), you're in the same boat. Portable office PCs range in price from \$3,500 to about \$6,000, compared to \$2,500 to \$4,000 for a good quality sub-notebook.

If you're shopping for a portable presentation computer—for making sales presentations, for example, look for an *active matrix* color display that is as large as possible. A larger hard disk and lots of memory (16MB) will make your presentations run faster and more smoothly. Expect to spend \$4,000 to \$7,000 for a color presentation-quality notebook PC.

Running OS/2 Warp 3.0 on a laptop

Most of today's newest laptop and notebook computers will run OS/2 Warp 3.0, but a few won't (the Compaq Aero, for one). In many cases, OS/2 Warp will run on the portable computer, but it might not support some of the LCD's color capabilities, fail to use the built-in sound chip, or have other limitations. Unfortunately, many sales clerks will tell you anything to make the sale, even claiming OS/2 compatibility without justification. This happened to us with the Aero: After the sale, David Moskowitz had to call Compaq to discover their Aero was never intended to be used with OS/2.

The solution: If OS/2 isn't specifically mentioned in the laptop's literature, check with the manufacturer to find out if OS/2 Warp 3.0 is compatible and

fully supported by their computer. If you're buying from a store, ask the retailer to guarantee a full refund (in writing, of course) if you're not able to use OS/2 to your satisfaction. A safe bet might be to ask either the manufacturer or retailer to preload OS/2 on the laptop before delivery.

If you're planning to use a laptop as your only computer, you should realize that portable computers are typically slower than comparable desktop PCs. Yes, a 66MHz 486DX2 is a 66MHz 486DX2, on the road or the desktop, but the microprocessor is only one of many components in a PC.

Everything is a trade-off. All portable PCs, especially sub-notebooks, are designed to minimize size, weight, and power consumption, at the price of generally reduced performance. Portable hard disks, which consume little power and stop when they're not being accessed, are slower than similar-capacity desktop units. A non-multimedia-ready portable PC's liquid-crystal display generally won't have a dedicated accelerator chip and lots of VRAM. The LCD itself is also much slower to react to software input than a cathode-ray-tube-based desktop monitor, resulting in sluggish window dragging, animation, and mouse movement.

Further, most portable computers don't use the newest high-performance bus technologies: you won't find too many portables that boast EISA, PCI, or microchannel buses—though by the time you read this article, the Texas Instruments 5000M should be shipping with a Pentium processor and PCI bus. After considering these limitations, don't be surprised to find that your new laptop is 10 to 30 percent slower than a similarly equipped desktop PC.

Now, let's take a look at the components you'll find in a notebook computer, and which you should choose for OS/2 use.

Processor

OS/2 Warp requires at least a 386 processor, but most stores won't have such old models in stock. Today, it's challenging to find anything less than a 25MHz 486SX in a modern notebook or sub-notebook PC. You can run OS/2 Warp 3.0 on this microprocessor, but remember that the notebook computer will be slower than the comparable

Laptop-friendly OS/2 Warp 3.0

OS/2 Warp 3.0 supports PCMCIA cards—those small credit-card-sized boards that contain memory, network adapters, modems, or even CD-ROM adapters. OS/2 Warp also includes APM (Advanced Power Management), and has provisions for multiple *config.sys* files, one for use in the home or office, and another appropriate for the LAN-less hotel room. If you're using a liquid-crystal display (LCD), you can change the size and color of OS/2's pointers and enable a "comet" cursor to make it easier to find the pointer on the screen.

OS/2 Warp's PCMCIA support goes beyond Windows 3.x's support with a feature generically referred to as "plug-and-play"—IBM calls it Play-at-Will. With plug-and-play, you don't have to turn off the computer or reboot when you insert or remove cards. This may sound unnecessary if you've never used a laptop. But trust me: It's a major convenience.

OS/2's APM helps conserve precious battery power. Multiple *config.sys* files allow you to load network drivers when your portable computer is attached to a docking station and skip loading them when the docking station is 100 miles away. The comet cursor and configurable pointers allow you to modify the cursor to accommodate the display limitations of some laptops.

desktop computer. We recommend a minimum 33MHz 486SX processor for a sub-notebook. If you're using the notebook PC as a portable office or for presentations, we recommend at least a 50MHz 486DX2.

Memory

IBM claims that OS/2 Warp runs in 4MB RAM, and they're technically correct, as long as you don't mind if OS/2 keeps swapping everything to and from the hard disk. But since hard disks drain the battery, and laptop hard disks are generally pretty slow, you won't be happy with anything less than 8MB for an occasional-use sub-notebook, and 12MB to 16MB for a notebook PC that will be used often or for multimedia. It's often cheaper to purchase third-party memory than the manufacturer's own brand of memory. On the flip side, it's often tricky to upgrade a notebook computer's memory yourself, unless it's expandable through PCMCIA slots. Make sure that adding third-party memory (assuming similar quality and speed) won't void the warranty.

Hard disk

A full installation of OS/2 Warp will consume about 60MB disk space, plus about another 20MB for swap space. If you plan to use the notebook PC only when traveling, and only have a few business and communications applications, a 170MB hard disk should be adequate for a sub-notebook PC. Toss in multimedia, a few games, Lotus Notes, a large application suite, and you'll find that a 340MB hard disk could be tight. Figure out what you are going to need and add 30 to 40 percent for future growth. Keep in mind that, unlike desktop PCs, it's prohibitively expensive to upgrade nearly all notebook hard disks (and after the model's been discontinued, it's often impossible), and you won't even have the consolation of moving the old hard disk to another computer. Our advice: get the biggest hard disk you can afford, but nothing less than 340MB on a portable office PC.

Display

While it's possible and slightly less expensive to buy a monochrome display, it wouldn't be our first choice, except for a low-end sub-notebook

used primarily for telecommunications. Color displays allow you to see the same thing on the road as at home, without having to squint or keep changing color palettes. Standard VGA resolution (640x480x16 colors) is the

standard on most portable PCs. Insist on super VGA (SVGA) with a minimum of 256 colors if you will be doing any type of presentations using graphics or multimedia. (If your budget allows, you can buy notebooks with screens capa-

10 tips for savvy buyers

1 Spend some time with the notebook or sub-notebook's keyboard and make sure you can use it for an extended period of time. Many portable PCs condense keyboard space (key size and distance between key centers). If you are very comfortable with a standard desktop computer keyboard you might not be happy with anything smaller. Make sure you can live with the keyboard layout of the portable, too.

2 While OS/2 Warp technically works in 4MB RAM, don't settle for less than 8MB on a sub-notebook PC. 12MB or 16MB is even better for a portable-office PC. Be aware that most laptops only have room for a single memory-upgrade module, which today is typically 4MB, 8MB, or 16MB. (We'll begin seeing 32MB modules sometime soon.) Check out the "maximum memory" specification for the computer: many list 20MB as the maximum, which might be a little low if you intend to keep this expensive computer for more than a couple of years.

3 Active matrix provides the sharpest most vibrant color. It also has the widest viewing angle. On the other hand, you'll save between \$700 and \$1,200 if you buy second-best: a good dual-scan passive-matrix color display. Check carefully when comparing models, since some manufacturers typically install active matrix displays only on their high-end notebooks, which include larger hard disks and memory.

4 Although OS/2 Warp will run on a 386 microprocessor, don't consider anything less than a 33MHz 486SX for a sub-notebook or infrequent-use notebook. At the next level are portables with 486DX2 processors (50MHz and 66MHz), followed by 486DX4 processors (75MHz and 100MHz). Starting late 1994, Pentium-based portables became available from a few manufacturers. If you buy a Pentium-based portable, make sure it is a 3.3 volt CPU with APM. Any other Pentium notebook is a battery killer. We recommend at least a 50MHz 486DX2 for a portable-office PC.

5 Get the biggest hard disk you can afford. Don't buy anything smaller than a 170MB hard disk, and we recommend at least a 340MB hard disk.

6 Look for notebooks with two PCMCIA Type II slots that will take a single Type III card. Some notebooks provide two separate PCMCIA areas so that you can use a Type II card in one and a Type III card in another (such as the Toshiba 2400). We recommend a notebook that can take at least two Type II cards.

7 Batteries have a hierarchy. At the low end are nickel-cadmium. In the middle you'll find nickel-metal-hydride—they last longer than NiCd's and cost more. At the upper end are the lithium-ion batteries. We recommend nickel-metal-hydride (NiMH), but if you like a NiCd-only notebook, and the predicted battery life is sufficient, go for it. In general, if you spend time away from a power plug, take a spare battery (or two). Consider the amount of time it will take to recharge the battery. Quick-charge batteries (rated for one to three hours recharging time) might take much longer if the computer's turned on—perhaps as long as 12 hours for a full charge.

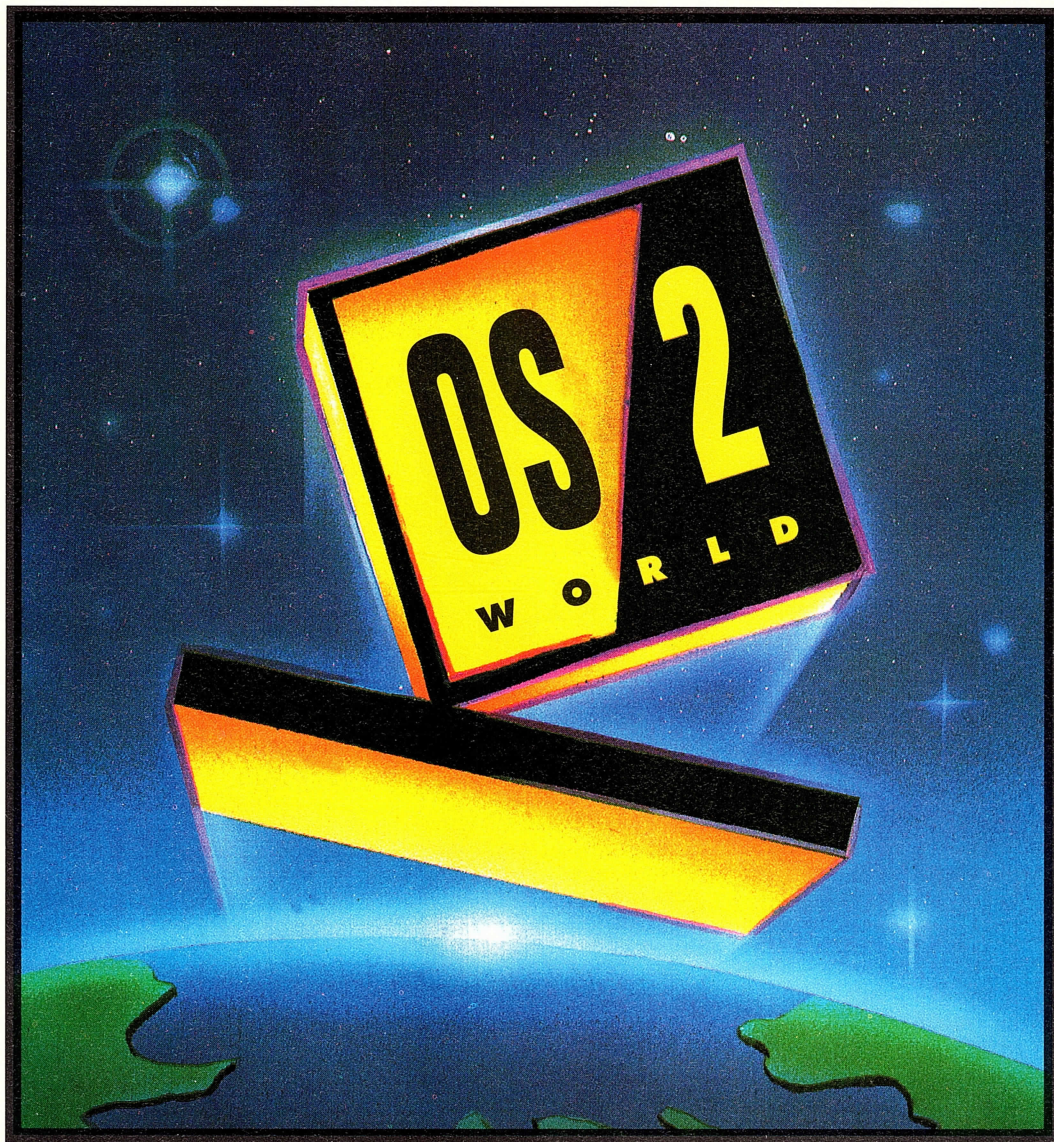
8 For presentations, make sure the computer includes VGA output; some sub-notebooks require an extra adapter.

9 If you're ever planning on making presentations or using multimedia, your color notebook display should be capable of at least 256 colors at 640x480. Some portables provide 1,024x768 on an external monitor. Portables that provide this higher resolution will also have 1MB VRAM, and might offer a graphics accelerator chip. Make sure the high-resolution accelerated chipset is OS/2-compatible in all display modes.

10 Make sure you get a guarantee that you can return the unit for a full refund if it doesn't work properly with OS/2 Warp 3.0.

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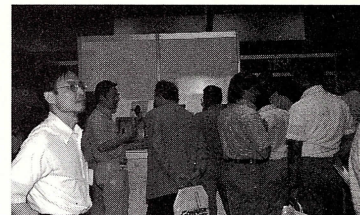
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ble of displaying 65,536 colors, but I can't think of many applications where that type of display would be necessary.) Make sure OS/2 Warp 3.0 supports the notebook's SVGA chipset. Otherwise, you will be stuck in 16-color mode and will have wasted the money spent on the extra video hardware.

What type of color display should you choose? The best displays will be the active-matrix color (you'll find the phrases "active matrix" or "thin-film transistor," or the abbreviation "TFT," in brochures and advertisements for monitors). They're clearest and brightest, and can be read by someone standing off at an angle—essential during sales presentations, potentially embarrassing in an airplane seat. The best active-matrix displays are the first notebook screens to be as easy to read as a standard monitor.

If you don't plan to share your computer with anyone for brainstorming or sales presentations or you're on a tight budget, a passive dual-scan color LCD is an acceptable substitute. (That is, it's an acceptable substitute unless you spend a lot of time looking at someone else's active-matrix display—once you're used to active matrix, you'll never settle for anything less.)

The acid test for any portable PC's screen is full sunlight directly on the display. If you can still see the screen, you're unlikely to have a problem at 35,000 feet when the person next to the window doesn't want to pull the shade down.

A few high-end notebooks include multimedia-ready video accelerators in their SVGA models. If you want a fast PC for presentations or multimedia, look for accelerated graphics in the notebook's specifications. Again, make sure this VGA accelerator chip set is compatible with OS/2 Warp—you probably will need to call the manufacturer's technical support line to determine the display's chipset and level of OS/2 compatibility.

Pointing device

You have two basic choices for a pointing device: one integrated into the computer, or something detachable. Integrated devices, which are built into the portable PC's keyboard or case, are typically trackballs (like an upside-

down mouse) or a pointing stick (like IBM's famous red TrackPoint button). Detachable pointing devices can hang off the side of your laptop, or be connected with a wire. Make sure that the pointing device hangs off the side you prefer.

Both authors have tried many pointing devices, and both prefer the pointing stick. Trackballs and mice require cleaning, usually at 30,000 feet on a bumpy plane. The last thing we want to do is take the thing apart on the plane and run the risk of losing the ball, just to keep the mouse from skipping. If possible, test your friends' laptops and their pointing devices, and see which works best for you.

Power

If you spend a lot of time away from an electric outlet, battery type and life will be a big concern. There are three basic types. Nickel cadmium (NiCd) batteries are the most common, but can suffer from the so-called "memory" effect: If you don't treat them properly, your four-hour batteries will last only about 75 minutes. Nickel metal hydride (NiMH) batteries don't suffer from the

same memory problems as NiCd batteries, but they're usually much more expensive. The latest battery technology is lithium-ion, which also doesn't have a memory effect and is supposed to last longer than the others. However, lithium-ion batteries are so new that they don't have much of a track history. We recommend NiMH batteries for both notebooks and sub-notebooks.

Computer batteries aren't standardized in either size, shape, output, or life. You can't buy a computer with NiCds, go to your local supply store, and drop in a NiMH or lithium-ion battery pack. (Although they are sometimes offered by third-party or mail-order companies, exercise extreme caution before using a non-standard battery in your new portable PC!). Buy a spare battery or two when you buy the new notebook PC.

To help conserve battery power, look for a computer that is "APM-compatible." OS/2 Warp supports the industry-standard advanced-power-management BIOS, which means an extra hour or more of battery life—a requirement if you find yourself flying into head-winds on that long cross-country flight. Some manufacturers have implemented APM so that, when you plug the notebook in, it runs at full speed, and when running on batteries, the CPU automatically slows down to conserve battery life.

OS/2 Warp supports APM's "suspend and resume" capability, which saves the state of running applications and disconnects power from peripherals, like the hard disk and serial ports. Power still flows to the components that are vital to preserving a state of "sleep," such as RAM. While the computer is in this mode, it continues to draw battery power, but at a drastically reduced rate. Today's portables can remain in this state for several hours; some can remain in suspended state for days. The resume feature restores power to the entire computer.

PCMCIA

Look for a portable PC that provides PCMCIA support for expandability. Three types of cards are available. Type I and II are thin. Type I cards are usually memory expansions, and Type II cards include network adapters and modems. Type III cards, which are

OS/2 Road Warriors Survival guide

There are a few things you should always take with you when you're on the road. Start with freshly charged batteries (yes, it is a good idea to have a spare). Make sure to pack your AC adapter and power cord.

Armed with these basics, you're ready for a trip to Radio Shack to get an AC extension cord, telephone extension cord, adapter that will connect two phone cords together to make a longer cord, and an adapter that plugs into the phone and provides space for two connectors. Round out the kit with a small screw driver (I have one with Philips head on one end and flat head on the other), and a small pocket knife.

Are you worried about airport x-ray machines? Unless an x-ray machine is very out of adjustment, it will cause no damage to your notebook computer or the data stored on floppy disks or hard disks. If you have the time, you can have the computer hand-inspected—but there's no reason not to allow your notebook PC to be x-rayed. (I always allow mine to be x-rayed).—David Moskowitz.

about twice as thick as Type II cards, are generally portable hard disks. Usually a Type III slot will accommodate either two Type II cards or a single Type III card.

The most popular PCMCIA card is a modem. If you need a modem, installing one in the slot is an option. In truth, since most people use a modem with the portable, I'd rather see the manufacturers build them in, as they did before PCMCIA became commonplace. Today, some of the higher-end models from IBM, Texas Instruments, and other vendors do. Remember that if you tie up a PCMCIA slot with memory expansions, you can't use that slot for anything else, so it's better to add memory to dedicated memory slots if possible.

Docking stations

Docking stations extend the reach of a portable office PC by providing additional ports, batteries, power, access to larger displays, stereo speakers, CD-ROM drives, standard ISA expansion slots which can be used for network boards, and more. Docking stations are generally used in the office or home, but for long trips, you can check them into your luggage. Ask about size and weight: One of IBM's ThinkPad docking stations adds about four inches to the height of the unit, making it impossible to use the ThinkPad keyboard for any serious work. Thus, to use this docking station you will also need an external keyboard and mouse.

Some high-end notebook PCs come equipped with stereo speakers. A few also come with a CD-ROM drive built in. Of course, you'll pay dearly for this high-end accessory—at least in 1995. Some day, a portable CD-ROM drive will be standard equipment!

Ready to roll

At first, it might appear that some notebooks aren't fully compatible with OS/2 Warp 3.0. However, you may be surprised. For example, you can run OS/2 Warp on a Texas Instruments 4000M, even though the installation program won't find the PCMCIA adapter. The trick, according to TI's tech support department, is to install support for the AST Bravo. The moral of the story: Investigate thoroughly before

determining that a notebook or sub-notebook is (or is not) fully OS/2 Warp-compatible.

If you've picked up a notebook with limited hard-disk space—or if you're planning to use the portable PC infrequently—you can save space by installing a subset of OS/2. Skip the documentation, most of the optional system utilities (keep "Change file attributes"). You can save another megabyte if you skip Mah-jongg and Pulse (if you're addicted to Mah-Jongg, then consider axing the other games). If the tiny text editor, TEDIT, is sufficient, you can skip the Enhanced Editor, too. If your notebook doesn't support multimedia, or if you don't envision needing audio or video support, you can save even more space by skipping over MMPM/2.

In a perfect world, of course, we'd all be able to buy four-pound 100MHz Pentium-based notebooks with 24MB RAM, two type III PCMCIA slots, a five-hour lithium-ion battery, 1,024x768x 65,536 active-matrix color display, 1GB

hard disk, internal quad-speed CD-ROM drive, built-in stereo speakers, and a 57.6kbps fax/data modem. All for under \$3,000, naturally, including spare batteries and fashionable carrying case. But until we find that "dream" portable PC, we'll have to make due with less. The best news is that OS/2 Warp runs great on many of today's notebooks and sub-notebooks.

David Moskowitz is president of Productivity Solutions, a Norristown, Pa.-based consulting firm that specializes in OS/2 and object-oriented development. He is a contributing editor to OS/2 Magazine and a featured author of OS/2 Warp Version 3 Unleashed (SAMS Publishing). He can be reached at CompuServe 76701,100 or via Internet at dmoskowitz@cis.compuserve.com.

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Inside TCP/IP

For OS/2

Understanding and using the Transmission Control Protocol/Internet Protocol. **By Bob Panza.**

Among the many LAN protocols running today on large-scale computer networks, the Transmission Control Protocol/Internet Protocol (TCP/IP) suite prevails as the de facto standard. All computer platforms, including OS/2, DOS, Windows, Macintosh, UNIX workstations, midrange processors, and mainframes, can embrace TCP/IP. A common protocol suite helps to alleviate the interoperability woes that characterize heterogeneous distributed computing. Before using TCP/IP, it's important to become familiar with its significance and basic functionality. This article assumes a basic familiarity with local-area networks.

Protocol convergence

As network computing evolved, proprietary protocols proliferated. The Novell NetWare world advocated Sequenced Packet Exchange/Internet Packet Exchange (SPX/IPX). IBM ran Data Link Control (DLC) and Network Basic Extended User Interface (NetBEUI). Microsoft brought Named Pipes into the fray. Macintoshes were built around AppleTalk. DEC maintained its own extensive array of network protocols. Meanwhile, the UNIX world focused on TCP/IP.

Protocol offerings soon overwhelmed physical topologies, and greatly contributed to the difficulty of getting all network nodes to work together. The holy grail of standardization was sought via the International Organization for Standardization/Open Systems Interconnection (ISO/OSI) reference model.

While the ISO/OSI reference model was embraced in the real world at the physical layer and in part at the data-link layer, the so-called "middle layers" (network, transport, and session) remained the dominion of non-standard, proprietary product offerings. Since much of the ISO/OSI model failed to take hold in the middle layers, protocol proliferation lingered and complex corporate interoperability suffered as a result. The dynamics of the multiprotocol environment overburdened network-management resources. Many corporate network empires were strained as though they were under siege by invading protocol hordes.

On the standards front, the U.S. Department of Defense (DOD) oriented "open systems" contributed TCP/IP as the ad hoc fallback to the ISO/OSI model for clean interoperability at the middle layers. Many driving forces pushed TCP/IP forward as an informal standard for non-DOD business environments. The time was right, the need was great, and TCP/IP had an appealing diplomatic posture.

Meanwhile, corporate systems that were downsizing began to transfer legacy systems from mainframes onto UNIX-based platforms. The on-going trend of downsizing has continually increased the utilization and importance of TCP/IP. Universal acceptance of TCP/IP became easy to attain because the suite had proven itself over the years and was not considered to be proprietary in protocols. As a result, TCP/IP won the protocol popularity contest hands down in the eyes of vendors and end-user companies alike.

TCP/IP is also remarkably well behaved. As a resilient "good guy" suite of protocols, it does not like to step on other protocol traffic or aggressively hog bandwidth. Its entrance into the multiprotocol arena makes things better, not worse. In addition, TCP/IP works particularly well on large packet-oriented networks, including the largest—the Internet.

TCP/IP Packages

Leading TCP/IP vendors have offered TCP/IP on OS/2 for quite a few years. Thus, the software offerings are well established, although limited in number. TCP/IP for OS/2 packages include:

- LAN Workplace for OS/2, version 3.0 by Novell
- Pathway Access for OS/2 by Wollongong Group
- PC/TCP Network Software, OS/2 1.3 by FTP Software
- TCP/IP 2.0 for OS/2 by IBM
- TCP/2-OS/2 by Essex Systems

For detailed information on TCP/IP products, check out *LAN Magazine's* 1994 Buyer's Guide issue, which contains a summary of the features of various offerings.

Among the vendors, IBM is the major player, since it is the biggest proponent of OS/2. Novell is also an

important OS/2 activist because of widespread NetWare connectivity at large end-user sites where there is a

major IBM and UNIX presence. Many OS/2 nodes are back-end database or communication servers, which run the

TCP/IP Glossary

TCP/IP terminology is extensive and very technically oriented. Some basic terms are summarily defined below, but keep in mind that they really only scratch the surface. A good TCP/IP textbook or manual will provide much more detail.

Address Resolution Protocol (ARP): The network-layer protocol that translates a network-layer IP address into a physical layer address (sometimes referred to as a hardware or MAC address).

Domain Name System (DNS): A hierarchical system supporting the translation of high-level (symbolic) node names to TCP/IP addresses.

File Transfer Protocol (FTP): This application-layer protocol facilitates node-to-node transfer of files and directory structures between an FTP server node and a client logged into the FTP server.

FTP Application Programming Interface (API): An API that provides applications with a client interface for file transfer.

Finger Protocol (FINGER): An application-layer protocol that supplies an interface for querying the status of a remote host or a user ID on a remote host. FINGER utilizes TCP as its underlying transport protocol.

Internet: The term once meant the Defense Advanced Research Projects Agency (DARPA) Internet. Today, there is a significant commercial Internet presence. In essence, "Internet" refers to the public virtual network that utilizes the TCP/IP protocol suite for node-to-node communication. The Internet (big "I") should not be confused with an internet (small "i"), which generically represents any packet-switched network or integrated group of packet-switched networks.

Internet Control Message Protocol (ICMP): A network-layer protocol designed to handle error conditions and control messages pertaining to network communication problems.

Internet Protocol (IP): The protocol providing packet-delivery services at layer three for node-to-node communication via connectionless datagrams. "Connectionless" implies that packet delivery is not guaranteed at that layer.

Interoperability: The ability of different computer system environments and/or applications to communicate with each other across a network in a fashion largely transparent to the computer user. ISO documents often use the term "interworking."

Network Computing System (NCS): A programmer tool kit for distributed application-system development. NCS facilitates high-level program calls similar to RPC. A programming interface to NCS is provided by TCP/IP.

Point-to-Point Protocol (PPP): The standard serial protocol for communication to the Internet. PPP embraces layers 1, 2, and 3 of the OSI model to provide connection control, error correction, compression, and other features lacked by SLIP.

Port: An endpoint supporting a logical connection between remote nodes running the same application system.

Protocol: Protocols define the format and rules for the transmission and receipt of information in a homogeneous or heterogeneous computer network. While the networked computer systems may be dissimilar in architecture, a common protocol stack or protocol gateway must exist between communicating nodes to facilitate interoperability.

Remote Procedure Call (RPC): A high-level programming interface

that calls subroutines to be run on a remote host rather than locally.

Reverse Address Resolution Protocol (RARP): The opposite of ARP; it translates a hardware address into an IP address.

RouteD: An application layer function that deploys RIP to dynamically create and maintain network routing tables.

Routing: A network-layer function whereby a network-attached device determines where to send a packet based on the packet's destination address.

Routing Information Protocol (RIP): An application-layer protocol utilized to continually maintain routing table entries in routers, gateways, and host computers. Information in the routing table indicates the best way to send packets across the network from one node to another.

Serial Link Interface Protocol (SLIP): A non-standard network-layer protocol that allows for point-to-point communication via TCP/IP across a serial line. SLIP lacks the complexity and full features of PPP. It is satisfactory for direct computer-to-computer links but can be inadequate in a large dynamic WAN environment.

Simple Mail Transfer Protocol (SMTP): An application-layer protocol used for sending and receiving mail. It also provides specifications for functional third-party e-mail system interaction and control.

Simple Network Management Protocol (SNMP): A protocol used by network components, such as bridges, routers, and other intelligent network management devices, to exchange network-management information.

Socket Address: A port number combined with an IP address that identifies a particular logical connection in use by an application system.

Socket Interfaces: Interfaces available for custom applications to access and thereby utilize TCP or UDP for communication over a network.

Telnet: The standard ISO/OSI layer 7 terminal application that supports character, block, and graphics terminals under TCP/IP.

Trivial File Transfer Protocol (TFTP): A simplified file-transfer protocol that allows single files to be transferred between network nodes but does not facilitate security or directory control like FTP.

Transmission Control Protocol (TCP): A transport-layer protocol supporting connection-oriented services for node-to-node communication over the network. Connection-oriented services are referred to as "reliable" because packet delivery is "guaranteed."

TCP/IP Protocol Suite: A group of protocols developed by DARPA and originally implemented on ARPAnet. ARPAnet eventually evolved into the Internet.

User Datagram Protocol (UDP): A transport-layer protocol providing connectionless communication services across a network via datagrams. Connectionless services are sometimes considered unreliable because the protocol does not ensure that packets reach their destinations.

X.25 Protocol: An International Telecommunications Union - Telecommunications Standardization Sector (ITU-TSS, formerly the CCITT) standard network protocol that can be used to establish a TCP/IP connection directly between two remote computers or between two internet-connected remote computers. X.25 is not part of the TCP/IP protocol suite; TCP/IP sits on X.25 only if X.25 is deployed in support of TCP/IP communications. The ISO/OSI model includes X.25.

NetWare Client for OS/2 software. Those back ends require the support of numerous different protocols to deliver enterprise interoperability. Concurrent support across the board must include SPX/IPX, TCP/IP, AppleTalk, and IBM legacy protocols. It is natural for those enterprise accounts to look to IBM or Novell for the TCP/IP component.

While the underlying TCP/IP protocol suite is fairly standardized, each vendor has put on their own twist of presentation and pizzazz. There are also differences in breadth and functionality within each package, although all of the packages maintain the basic TCP/IP features at the OS/2 command prompt. For example, both IBM and Novell offer ASCII Telnet; however, IBM offers Telnet 3270 and 5250 while Novell's LAN WorkPlace for OS/2 does not. In addition, Novell relies on Win-OS/2 for a graphical user interface (GUI) presentation while IBM's TCP/IP uses a Workplace Shell interface.

Functionality

A wide range of generic functions are built into OS/2 TCP/IP software packages at the application level, including terminal emulation, file-transfer utilities,

Table 1: Examples of Telnet subcommands.

?	Lists commands and displays help information. Synonymous with the HELP subcommand.
CLOSE	Closes the current connection with a remote host.
OPEN	Establishes a connection with a remote host and returns to the Telnet prompt.
QUIT	Exits the Telnet command shell.
SEND	Transmits a sequence of special characters to the remote host.
SET	Determines operating parameters.
TOGGLE	Switches operating parameters.

Table 2: Examples of major FTP subcommands.

?	Lists commands and displays help information.
ASCII	Sets the type of file transfer to ASCII.
BINARY	Sets the type of file transfer to binary.
BYE	Ends the FTP session and exits the command shell. Same as QUIT.
CD	Changes working directory on the remote FTP host.
CLOSE	Terminates the FTP session but stays in the FTP command shell.
LCD	Changes or displays the name of the working directory on the user workstation.
LS	Provides a short listing of the working directory's files.
GET	Transfers a specific file from the remote host to the user's workstation.
MGET	Transfers multiple files from the remote host to the user's workstation.
MPUT	Transfers multiple files from the user's workstation to the remote host.
OPEN	Establishes a connection to the remote host.
PROXY	Forwards commands to a server to allow a logical connection with another server. The objective is direct transfer of files between the servers.
PUT	Transfers a file from the user's workstation to a remote FTP host. Synonymous with SEND.
STATUS	Displays status of the FTP connection.

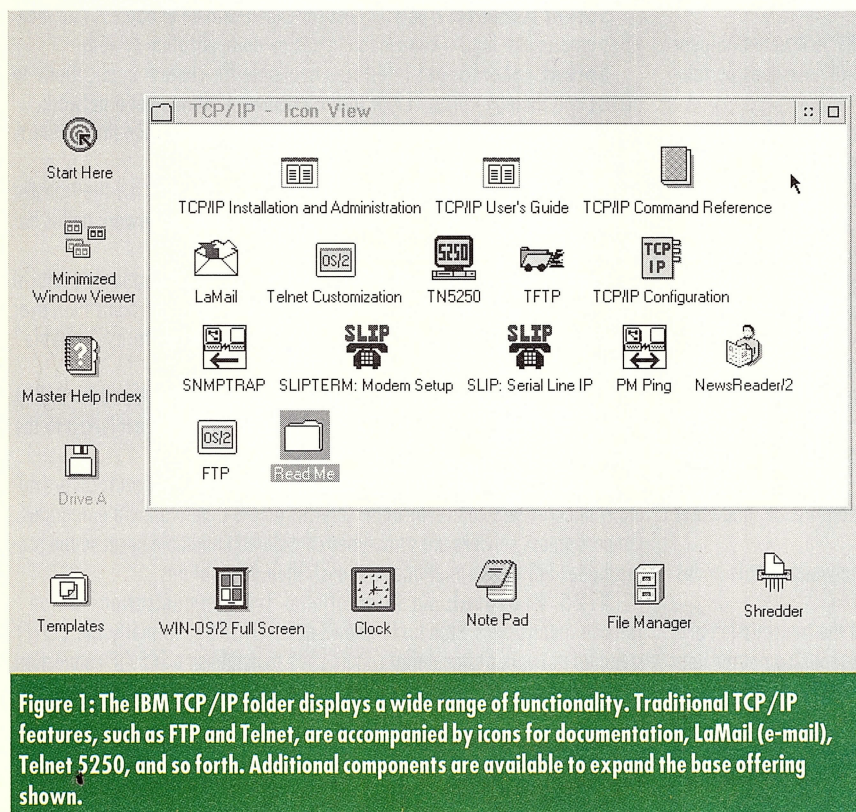


Figure 1: The IBM TCP/IP folder displays a wide range of functionality. Traditional TCP/IP features, such as FTP and Telnet, are accompanied by icons for documentation, LaMail (e-mail), Telnet 5250, and so forth. Additional components are available to expand the base offering shown.

ties, remote printing utilities, and remote command utilities. In addition, any specific application can run on top of the TCP/IP stack. For example, Lotus Notes and almost all database server-based applications can be configured to run with TCP/IP. The fact that an application sits on and utilizes the TCP/IP stack should be largely transparent to end users.

Both FAT and HPFS are supported for OS/2, DOS, and Win-OS/2 sessions. (However, DOS and Win-OS/2 cannot access HPFS files with long file names.) The OS/2 TCP/IP packages typically present their wares on the desktop in a user-friendly manner with pull-down menu options, iconized commands, dialog boxes, and other user-interface options unique to each package. Mainstay TCP/IP applications, such as terminal emulation and file transfer, can be adapted to work behind each vendor's desktop-based GUI utilities. The look and feel of native OS/2 and Win-OS/2 dramatically transforms the staid TCP/IP command line.

Terminal emulation through Telnet

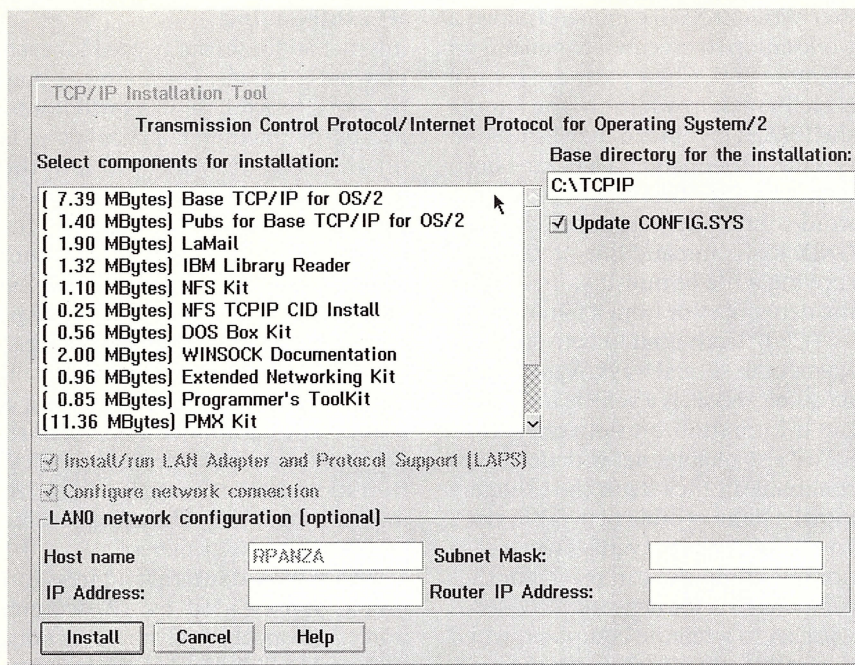


Figure 2: *Tcpinst.exe*, the IBM TCP/IP installation program, reveals optional components: NFS selections, DOS Box Kit, WINSOCK documentation, Extended Networking Kit, Programmers' Toolkit, and PMX Kit. X client selections and Domain Server Kit are out of view below the PMX Kit line. IBM also offers OSF/Motif and NetBIOS-TCP/IP kits.

typically supports ASCII terminals, such as TNVT220, VT100, and VT52. The user invokes Telnet by clicking on a Telnet icon (for example, the Host Presenter in LAN Workplace) or by executing the command TELNET at the OS/2 prompt. A Telnet prompt will vary depending on the type of terminal emulation invoked (TELNET> VT220> or TN> and so on). After logging into a remote host, users operate the Telnet session as though they are using a dumb terminal connected to the remote host. See Table 1 for examples of Telnet subcommands.

File transfer between TCP/IP networked computers is primarily governed by File Transfer Protocol (FTP) and Trivial File Transfer Protocol (TFTP). FTP provides subcommands, security, multiple client support, and handles High Performance File System (HPFS) long file-name support. However, TFTP is limited to transferring one file at a time, its daemon services only one client at a time, and it lacks security and subcommands.

"FTP" and "hostname or address"

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entered at the OS/2 prompt attempt to establish a connection with the host computer running as an FTP server. An FTP prompt looks like the obvious "FTP>." The user must provide identification and password as required by the host. File formats can be converted during transfer. Files can be deleted or renamed on the FTP server. It is also possible for the user to create or remove directories on the FTP host. Major FTP subcommands are listed in Table 2.

More Functionality

TCP/IP's SMTP protocol supports client and server e-mail. Nevertheless, an SMTP e-mail application must be run on top of SMTP. For example, IBM TCP/IP offers the LaMail user interface for sending, receiving, viewing, creating, and storing mail. LaMail works in conjunction with the Sendmail system. Sendmail actually sits between LaMail and SMTP. Sendmail performs e-mail routing and delivery. Line printer commands support remote printing and remote printer management.

The TALK command utilizes the TCP/IP TALK protocol to send and receive electronic messages. A remote

execution (REXEC) command allows a workstation to execute a command on a remote host, where password control is facilitated. In addition, the remote shell (RSH) command may be used to execute a command on a remote host; however, RSH does not deploy password control. Remote copy (RCP) is a UNIX-like command-line program for copying a file or multiple files across the network to or from a remote host.

TCP/IP lends itself to network management in several ways. A specialized protocol, SNMP, is a vehicle for gathering information on network status. SNMP also enables network devices to communicate their status and to inquire into the status of other network devices. The PING command verifies whether or not one computer can reach another computer over the network. PING sends a packet to a remote computer; when the remote computer receives the packet, it returns an "echo" packet back to the originator to confirm communication. NETSTAT displays status information about the local computer node's network interfaces, packet statistics (for IP, ICMP, TCP, and UDP), routing, connections, and socket-port numbers.

IP addressing

Internet addresses are needed for each network interface. The addresses may be arbitrary if the network will not be part of the Internet. If a network node (or an entire network) will join the commercial (non-Defense Department Network) Internet community, for example, then registered Internet addressing must be obtained from the Internet Network Information Systems Center in Herndon, Virginia. The registration process can be initiated by calling (703) 742-4777 or e-mailing a request to hostmaster@internic.net. Registration helps to prevent duplication of addresses and also helps to maintain an orderly addressing scheme as well as an orderly network.

The standard internet address format is represented by 12 decimal numeric characters separated by dots, such as 111.222.333.444. (An address appearing as 1.2.3.4 means 001.002.003.004; the leading zeros are often not shown.) Beneath their decimal representation, standard internet addresses actually consist of a two-part address field. The first part contains the network address. The second part holds

Figure 5: The PC TCP/IP Protocol Suite Architecture.

The non-DOD Personal Computer (PC) TCP/IP model boils the seven layers of the ISO/OSI model down to five layers by combining layer 5 with 4, and merging layers 6 and 7. TCP/IP is not a single protocol by any means; it is actually a collection of many protocols and communication application programs that are all engineered to work together. Physical layer topologies represent IEEE standards. The data-link layer may deploy IEEE, ODI, or NDIS standards (or some combination of all three or any two via piggybacking). MAC (hardware) drivers interface with specific network adapters. The TCP/IP protocol suite sits above the data-link layer. It will co-exist with other non-TCP/IP protocol stacks although none are shown in the diagram. The presence of X.25, PPP, or SLIP would modify the illustrated generic network interfaces.

Layered Structure

7. Application 6. Presentation	TELNET, FTP, TFTP, SMTP, SNMP, DNS, RIP, LPs, NCS, FINGER, TALK, Routed, X-Window, RPC, NFS, REXEC, KERBEROS, Socket Interfaces, etc.				Application
	Application Programming Interface				
5. Session and 6. Transport	TCP		UDP		Transport
	IP	ICMP	ARP	RARP	
3. Network	Link Level Interface				Internetwork
2. Datalink	Medium Access Control (MAC) Drivers				
1. Physical	Ethernet	Token Ring	FDDI	Other	Hardware

the local address, also known as the host address, which identifies the specific network node. Within the net-

work address, the high-order bit or bits indicate the class of address.

Network node address, router

address, and subnetwork mask are vital parts of the network node configuration. The network node's IP address must be unique for specific identification on the network. If a node has more than one network adapter, then multiple IP addresses are needed (one for each interface). A duplicate network address is a "no-no" because it raises havoc with packet routing. The local node's default router address identifies the router through which it will send and receive packets when communicating with nodes on remote networks.

There are five classes or types of IP addresses; classes A through C are the most commonly used. Class A addresses allow comparatively many local nodes within relatively few network addresses since most of the bits are available to define local addresses. Class C addresses define many networks and a relatively fewer number of local nodes within a network. Class B addresses, the most common type of IP address, are on middle ground nearly balancing the allocation of bits between networks and number of network nodes per network.

Administration of IP addresses becomes a nightmare if the situation gets out of control. No alternative, such as using a burned-in hardware address instead of the IP address, is available. Order or chaos rests in the hands of the system administrator and his or her clan of users.

Internetworks Ho!

As networks grow increasingly pervasive, expanding in breadth to potentially link all computing devices, the need for stability in the middle layers becomes an absolute necessity. TCP/IP promises a greater degree of network order and interoperability by streamlining middle layer complexity. Less problematic network environments are the inevitable and highly desirable result. Valuable technical resources can then be redirected to areas that contribute more directly toward the commercial enterprise's success.

Bob Panza is a LAN consultant affiliated with EJR Computer Associates in Hoboken N.J. and The Systems Expert in Woodbury, Conn. He can be reached via CompuServe as 71611,1262.

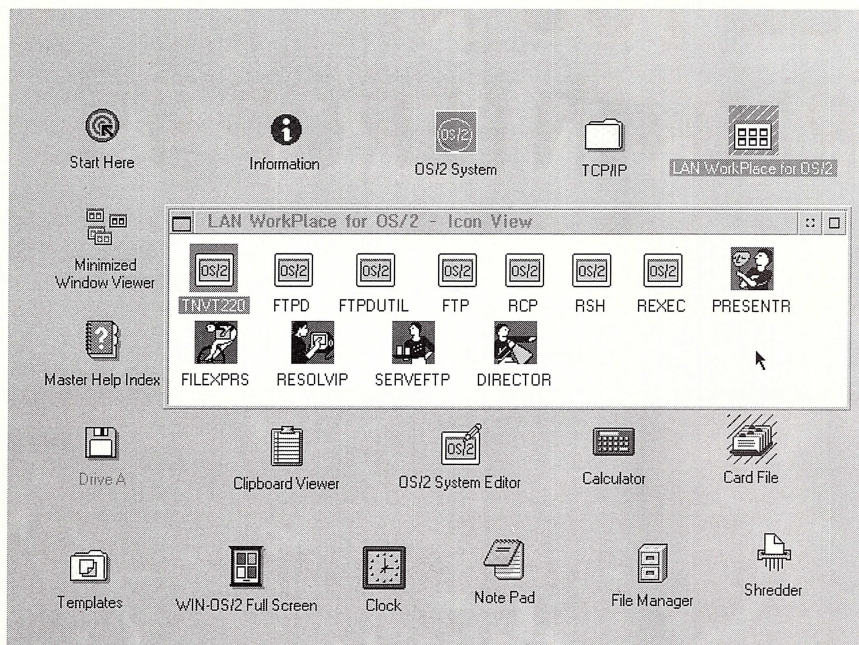


Figure 3: Novell's LAN WorkPlace for OS/2 has user-friendly features in addition to traditional TCP/IP functions. PRESENTR provides the user with a dialog box for Telnetting into a remote host. FILEXPRS facilitates file transfer through a desktop-based GUI rather than an FTP prompt. The local node can quickly become an FTP server via SERVEFTP so that remote nodes can access its disk drive.

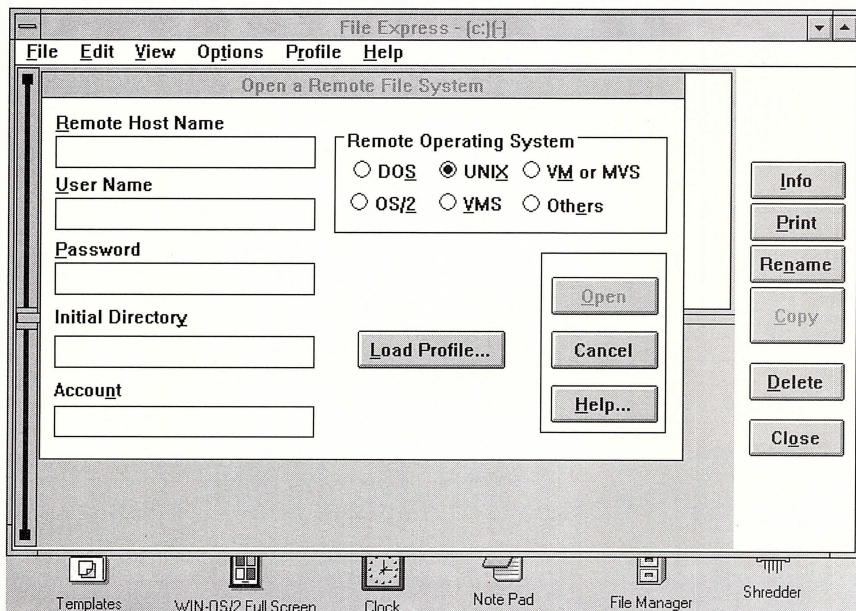


Figure 4: File Express can be used to access a file system on remote nodes running DOS, OS/2, UNIX, VMS, VM, MVS, or another operating system. Interoperability across operating systems seems as easy as clicking a button. FTP security is fully deployed.

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Multuser OS/2

Run OS/2 over a serial link with Software Lifeline's RemoteOS. BY ESTHER SCHINDLER

Cash-poor OS/2 users who want to share computer resources can't easily justify the purchase of a full-blown local-area network. Yet, when you need to share applications and data with your co-workers, or you have to make an expensive laser printer justify its existence, you need a product that can help you do so.

RemoteOS lets you turn your single-user, multitasking OS/2 system into a multi-user, multitasking OS/2 system. It does what it claims to do, but you may find that its text-based limitations constrict its real-world use.

Installation at the bare metal

Don't expect a fancy, graphical installation program. Everything here is text-based. The host installation insists on loading the files onto your *c:* drive (no other options offered), and adding three drivers to your *config.sys*. The machine I used as a host was a 33MHz 386 with 16MB RAM. The RemoteOS files used about 360K.

You can attach to the OS/2 host using a terminal or a DOS machine. I used a DOS VDM on my ancient 16MHz 386SX, a computer with which I've proven my OS/2 devotion by shoe-horning OS/2 into its 40MB hard disk and 5MB of RAM. In other words, this is about as tough a "DOS machine" as you could find.

To get access to the OS/2 system from a DOS computer, you use a terminal program supplied with RemoteOS. To install TERM, you run a batch file that copies the necessary files to the current directory on the DOS machine's hard disk. To change the parameters from the defaults, you edit *.ini* files in the *c:\trmman* directory and in the DOS terminal program. I hooked up the computers with a serial LapLink cable and I was ready to go. (I also could have used a modem for the connection.)

I found that I had to read most of

the manual before I could get started. This program is remarkably unintuitive; it seems like you have to know what you're doing before you can know what you're doing. On the other hand, by the nature of this sort of program, knowing what you're doing may be a good thing.

Most of the documentation was frustrating. It's hard to read; passing the text through a good desktop publishing program would make a lot of difference. More importantly, it was hard to get a concept of where I was going. A well-written introduction, serving as a kind of road map, would make the installation process much easier. However, I did find that the manual was complete and a satisfactory reference book.

Great. Now what can I run?

Once installed, RemoteOS ran quite well. I ran into one technical glitch—I kept getting 17 (exactly 17) spurious carriage returns on the remote laptop. That turned out to be a limitation of my own hardware; the DOS box running on the 16MHz 386SX was just too slow to run at 19,200 bps. When I stepped back to 9,600 bps, everything worked smoothly. Had I used a plain DOS computer, the Software Lifeline folks assured me, 19,200 would have run fine.

The only question was: What could I run? RemoteOS is limited to running OS/2 text applications (VIO) that don't write directly to the hardware. That limitation meant I had remarkably few programs that could do me any good. I tried Microsoft Word for OS/2, but that program writes directly to the screen. So does R:Base for OS/2.

MSGVU, a shareware message-management program for CompuServe and BBSs, ran perfectly. If I hadn't stolen the COM port for RemoteOS from my modem, I could have run Hilgraeve's HyperAccess/5. I searched my not-

inconsiderable collection of OS/2 software for applications that would run with RemoteOS, and found little else that would qualify. (When I tried to run a graphical application, the program would start—on the host machine, not on the remote laptop.)

The best OS/2 application under RemoteOS was DataFlex, a database development system that is supported on many platforms including OS/2, DOS, and Unix. The multiuser version of DataFlex ran well on both the host and remote, even permitting concurrent access to files. It ran snappily too, or as snappily as is possible on a 16MHz 386SX OS/2 system.

Possibly more useful than its OS/2 support is RemoteOS's ability to support DOS text applications. After all, more text-based DOS applications are available than text-based OS/2 programs. As with OS/2 applications, the program can't write directly to the hardware.

DOS applications use a command-line program: *rundos wp.exe*, or *rundos /s wpset wp.exe param.doc*. Under OS/2, you modify the DOS settings of a program object visually. Since you don't have that option on a DOS computer or a terminal, RemoteOS uses separate settings files to control how the program works, including *dos_autoexec*, *dos_files*, and all the rest. Each application can have its own DOS settings file or can share a generic one. You can also use these settings files to control how color is interpreted on terminals.

I successfully ran WordPerfect 6 for DOS on the laptop this way, as well as the DOS shareware program Namegram, which generates anagrams. I chose the latter program not because I needed to learn that "Esther Schindler" can also be written as "Clients Shred Her" (I already knew that), but because it passes a lot of data to the screen. WordPerfect 6 worked quite well, though not at a speed that

Review

would make you swoon. Namegram was pretty slow, but still usable. The performance can be adjusted by tweaking parameters in the settings files.

The DOS terminal program also allows you to exchange files between the remote and host with upload and download utilities. This feature works adequately (the file gets there) but there is no status display informing the user how long it will take to transfer the file, what percentage has been sent, and so on.

Do you need this program?

In my opinion, the most appropriate use for RemoteOS is with applications such as those based on DataFlex. In practice, this category includes niche products such as those that help manage doctors' offices, real estate firms, and small manufacturing companies. In these types of vertical markets, a graphical user interface adds little, but inexpensive operation (using old XTs

or terminals) can count for a lot. The end-user application will benefit from OS/2's speed, stability, and robustness. I was impressed with the performance of RemoteOS on a mere 33MHz 386. An application for, say, a doctor's office using RemoteOS with a faster computer and a few old 286s and XTs could be splendid.

Abraham Lincoln allegedly once said: "People who like this sort of thing will find this the sort of thing they like." It isn't the peer-to-peer network you may have been hoping for. Its inability to run PM programs destines it to a niche existence, since most new applications (thankfully) take advantage of the Workplace Shell. But, within its limited confines, RemoteOS is a good performer.

Esther Schindler is a computer consultant and writer. She is a contributing editor to OS/2 Magazine, the sysop of the Ziffnet

Executives On-line Forum on CompuServe, and the author of The New Riders Guide to Modems, from New Riders Publishing. You can contact her via CompuServe at 72241,1417.

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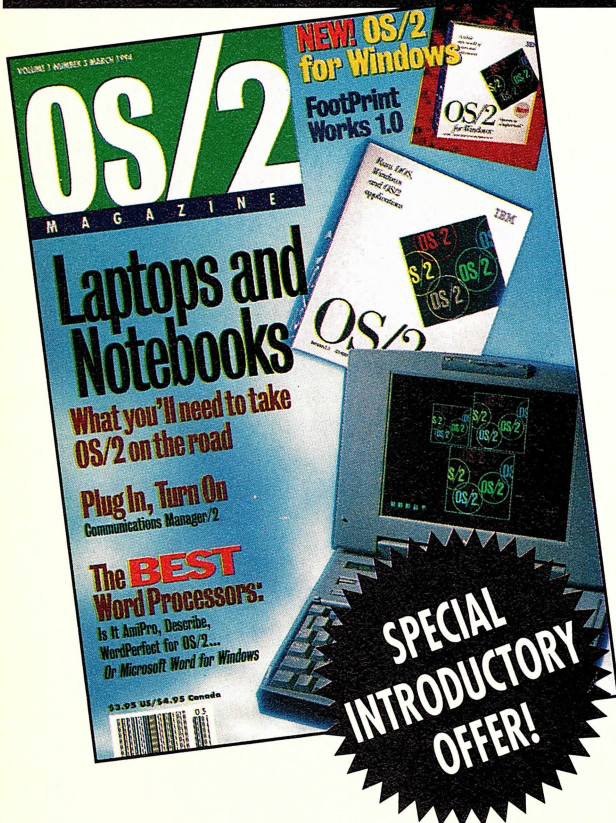
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Peer-to-Peer At Last

Setting up a network with LANtastic for OS/2. BY STEVEN J. VAUGHAN-NICHOLS

Networking has always been a pain in OS/2. You could always get OS/2 to work with LAN Server or NetWare, but only after blood, sweat and tears. And, if all you wanted was simple peer-to-peer networking, you were out of luck. That was then. This is now. Artisoft's LANtastic for OS/2 finally gives OS/2 an easy, fast route to building small- to medium-sized networks.

Artisoft LANtastic has long been the dominant peer-to-peer network in the DOS/Windows world. The virtues that made it a winner in that forum are all present and accounted for in LANtastic for OS/2.

At the same time, LANtastic for OS/2 doesn't bring any 16-bit operating system vices with it. It is a full-fledged 32-bit native OS/2 Presentation Manager application. With many OS/2 programs, you have to put up with character-based interfaces or a jury-rigged OS/2 adaptation of a Windows program. That's not the case with LANtastic for OS/2. For example, to set network parameters, you use an OS/2 settings notebook instead of fidgeting with an ASCII file.

LANtastic for OS/2's installation routine is as simple as a network-installation program can be. An experienced network manager should be able to complete the installation in less than an hour for the first machine and speed up from there. Even if you've never installed a network in your life, you should be able to get LANtastic for OS/2 up and running in two or three hours.

LANtastic uses the peer-to-peer model, where any

system can be a client, a client/server, or a server. This model gives you great flexibility. Need a network printer? You just find someone who will let their printer do the job and, in a few minutes, the printer is on-line for the entire workgroup. Need a file on Esther's machine? You can switch Esther's system to playing a server's role just as easily.

Compatibility

LANtastic for OS/2 isn't limited to performing these tricks on PCs running LANtastic for OS/2. The network operating system (NOS) also works with LANtastic for DOS and Windows. You don't need to jump through any fancy configuration hoops to achieve this compatibility. LANtastic for OS/2 can automatically and transparently put other LANtastic 5.0 or later resources to use. The reverse also holds true. Your DOS and Windows machines can hook into your OS/2 systems' re-

sources as easily as they do their own. If you're working in a mixed operating system shop, LANtastic can be the key to getting everyone's systems to work together.

This ability can be very powerful. For example, on a LANtastic network, my test OS/2 2.1 system was able to access CD-ROM and magneto-optical drives on DOS machines that it could never have used if the drives had been directly attached to the OS/2 system. LANtastic for OS/2 means never having to say "but I don't have a driver for it" ever again. The NOS works equally well with OS/2 Warp 3.0.

LANtastic for OS/2 isn't just limited to its own network cousins. The NOS also lets you work with Server Message Block (SMB) LANs such as Windows for Workgroups, Windows NT, and IBM LAN Server. With the additional Artisoft CorStream server program, you can also access NetWare 4.x resources as easily as you can any other

LANtastic resources. You can also run LANtastic for OS/2 simultaneously with Novell's NetWare Requester to work with Windows for Workgroups, NetWare, NT, and LANtastic servers all at the same time.

Besides superb interoperability, LANtastic for OS/2 works with both the FAT and HPFS file systems. The NOS can also use the Network Driver Interface Specification (NDIS) to work with most network interface cards (NIC). LANtastic for OS/2 also works with Artisoft's own AE and NodeRunner NICs and Eagle Technologies' highly popular NE2000 cards. For other cards, always make sure OS/2 provides a driver for your card before plunking

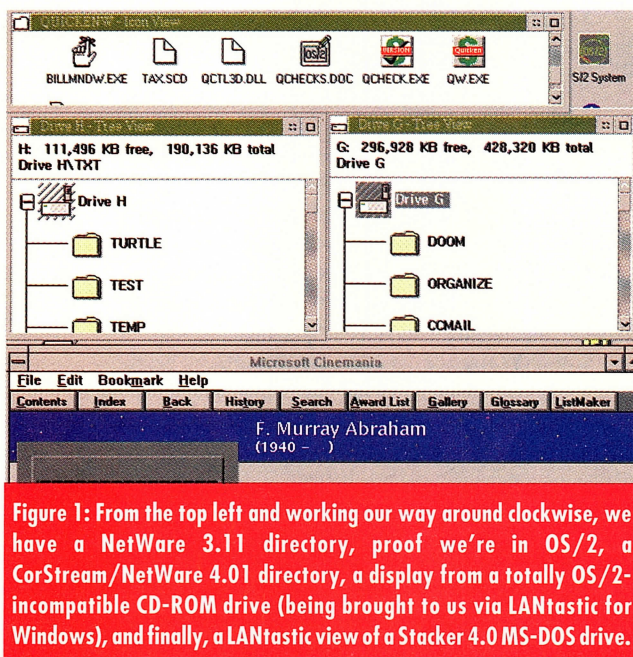


Figure 1: From the top left and working our way around clockwise, we have a NetWare 3.11 directory, proof we're in OS/2, a CorStream/NetWare 4.01 directory, a display from a totally OS/2-incompatible CD-ROM drive (being brought to us via LANtastic for Windows), and finally, a LANtastic view of a Stacker 4.0 MS-DOS drive.

any money down.

Speed is one of LANtastic's selling points. While you still can't beat pure NetWare for the best possible throughput, our informal tests showed LANtastic running faster than LAN Server and other SMB networks.

Ease of use is also a big winner. Once LANtastic for OS/2 is in place, users can work with server disks and printers as if they were connected to their own PCs. Naive users might never even guess that they are using a network.

Support

If you run into trouble, help's only a phone call away. Two priority help lines are available, but access will cost you a pretty penny. If you're willing to take a chance on waiting for a few minutes, you can call their toll-call help lines from 7am to 5pm Mountain Standard Time Monday through Friday. In our tests, the wait was rarely more than two minutes. Once you're in, Artisoft's technicians are knowledgeable and quick.

If you have a modem, you can also use Artisoft's CompuServe forum (GO ARTISOFT) or call their BBS at (602) 884-8648. Artisoft also has a fax-back answering service that handles the most common network problems. No matter which route you go, you'll find Artisoft takes technical support seriously and quickly finds the answer to your problem.

I doubt, however, that you'll need to go that far for help. The program's on-line help is accurate, concise and to the point. The manuals use a clear step-by-step approach, which should see you safely through your setup and network-administration jobs.

Security and management

Network security is one of the biggest administration jobs. Fortunately, LANtastic for OS/2 offers a full set of network-administration tools to work through these issues. You can set read/write/execution permissions by user, user group, directory, and file. This ability enables you to come up

with the right mix of security and freedom to ensure that touchy data remains safe while everyone gets their work done.

The NOS also has good server-auditing features. Once more, LANtastic's use of the OS/2 notebook interface makes deciding how to handle auditing very easy. Besides recording who's logging in when and what are they doing, you can also set the server to automatically trigger alarms when disk space grows short or when the CPU is being pushed to its limits. For a workgroup LAN, LANtastic gives you all the management tools you'll ever need.

LANtastic is a great addition to OS/2, but it's not perfect. The DOS/Windows versions come with an e-mail program and the ability to send faxes. You get neither in LANtastic for OS/2.

In the case of the e-mail program, that's not a big loss. The LANtastic E-Mail program is fine for mail within a workgroup network but, for talking to the outside world, you need a more robust e-mail program. As for faxing, your best move will be to get Softnet's NOS independent FaxWorks OS/2 LAN and use it on your LANtastic for OS/2 network.

You may also have trouble with some Windows-aware network programs running under a Win-OS/2 session. Some software packages, such as the older WordPerfect Office groupware program, look for specific Windows network application-programming interfaces (APIs) and, when they can't find them, these programs won't run. The network resources are available under Win-OS/2, but these programs can't find them. Other Windows network programs, such as Lotus' cc:Mail, work just fine in this situation. Artisoft is aware of this problem, and is working on a solution.

On the plus side, LANtastic for OS/2 supports Linkbook. This program enables you to view and copy data on the OS/2 clipboard to any OS/2 or Windows LANtastic system on the network. You can protect this information

so that not everyone will be able to access it.

You can use Linkbook in two ways. The first use is to store static data for wide-distribution. You could, for instance, use it to distribute the office phone list to everyone.

The more sophisticated way to use Linkbook is to use its dynamic data-exchange (DDE) bridging capacity to link DDE-capable applications across the network. For example, in accounting, you could link every accountant's spreadsheet by DDE to the master spreadsheet on an OS/2 machine to make sure that you always had the most updated information at hand. LANtastic also gives you tools for viewing your network DDE links so you'll always know whose data is going where.

Best of all, all this capability is available at a very reasonable cost. The prices start with \$139 for a one-user kit and go up to \$4,999 for 100 users. If you don't have NICs, Artisoft will also be happy to sell you, at market prices, either their own or Eagle Technology NICs.

I wrote that LANtastic isn't perfect. I'll also state that no NOS gives you anything like its power and ease of use. It's the simplest and best of its kind. If you want a workgroup LAN or want to hook your OS/2 system into a larger LANtastic or SMB network, there can be no argument. LANtastic is the NOS you must buy.

Steven J. Vaughan-Nichols is a freelance writer working out of Lanham, MD. He can be reached as sjvn@access.digex.net or CompuServe 72241,464.

RESOURCES:

LANtastic for OS/2 1.0 Artisoft (\$139)

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READER SERVICE NO. 154

Late-Breaking
Developments in the
World of OS/2

Just Announced

Two new OS/2 Image Editors!

ColorWorks 1.0

SPG Software has announced the first release of their high-end OS/2 image-editing software, ColorWorks 1.0. This program separates pictures into individual threads so that, while one picture is undergoing an operation you can be working on another. Other features include as many as 255 levels of undo, compression of pictures so that they use less RAM while open, and special support for SMP machines. Special effects filters, which include warping and freeform distortion, can be applied to any brush or fill. And, a special filter lab can create new effects. ColorWorks for OS/2 sells for \$495. Call SPG at (305) 362-6602.

READER SERVICE NO. 155

Imp-OS/2 1.2

The German company Compart Systemhaus GmbH, announced the first English-language version of their image-editing software, Imp-OS/2, which will be marketed by Indelible Blue. Image manipulation features of this program include rescaling, color and hue control, rotation, sharpness, cloning tools, local undo, palette manipulation, and text in pictures. Imp-OS/2 also accepts input from Photo CD, Movie Blaster or Video Blaster-compatible cards, and various scanners. Imp-OS/2 sells for \$129. Call Indelible Blue at (800) 878-9700, (919) 776-8284, fax (919) 878-7479.

READER SERVICE NO. 156



Performance Plus 3.0

A tuning fork for Warp

Clear & Simple is releasing a new version of their OS/2 tuning utility, Performance Plus. The new version includes context-sensitive help screens to teach you to improve your performance while the program optimizes the configuration. The utilities in this package include a *config.sys* optimizer, DOS session tuner, benchmarking program, OS/2 bitmap viewer, an OS/2 boot-disk creation program, and Swap-file monitor. The package sells for \$39.95 and includes

a disk of OS/2 bitmaps. Call (203) 658-1204 or fax (203) 651-0354.

READER SERVICE NO. 157

RhinoCom 1.0

WPS communications

Rhintek is releasing the first incarnation of their Presentation Manager communications program, RhinoCom. This program uses notebooks for session settings, has a REXX-scripting language, and runs in a resizable window. Terminal modes

include ANSI and VT100 emulation. Transfer protocols include text, Xmodem, Ymodem, and Zmodem. RhinoCom sells for \$199. Call Rhintek at (800) 234-4546, (410) 730-5960 or fax (410) 730-2575.

READER SERVICE NO. 158

IPFIDE 1.0

Help for making help files

TSC computing announced the first release of their IPF development program, IPFIDE. This product, which

Just Announced

**Late-Breaking
Developments in the
World of OS/2**

requires an IPF compiler, (for example, IBM's *ipfc.exe*) to work, aids in the making of OS/2 *.inf* and *.hlp* files. IPFIDE provides dialog boxes to help you navigate the key words, or tags, to create IPF documents, which only need to be compiled to be used. IPFIDE sells for \$49. Call TSC computing at (817) 263-5766.

READER SERVICE NO. 158

Swapper Plus! 1.0

Fight swapper growth

Proportional Software, the makers of DCF/2, are releasing a new program that conserves disk space by compressing the *swapper.dat* file OS/2 uses for virtual memory. This program, which works with any version of OS/2 2.11 or later, can compress the swap file over any combination of RAM and logical drives, including network drives. Swapper Plus sells for \$24.95. Call Proportional Software at (800) 666-4672, (303) 484-2665, or fax (303) 484-2670.

READER SERVICE NO. 159

Value Pack for OS/2

A smarter SmartSuite

Lotus Development announced the release of a set of utilities that enhance the use of the Lotus SmartSuite for OS/2. The main program in the package is the SmartCenter, a launch pad that has an integrated system-monitoring tool and a clock and it can show a hierarchical representation of the Workplace Shell Desktop. It also includes a set of macros that automate interaction between the OS/2 versions of Lotus 123, AmiPro, and Freelance Graphics, file filters for sharing data

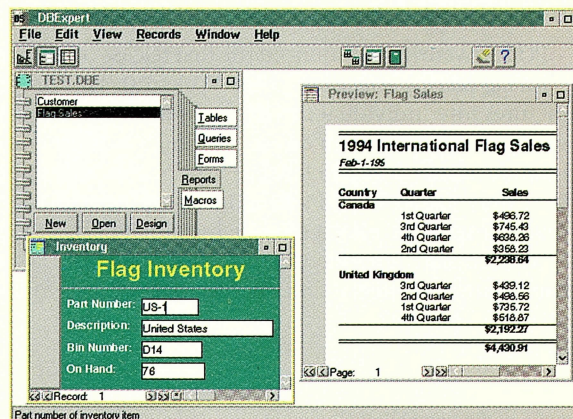
DBExpert 1.0

A graphic new OS/2 database

Designer Software is announcing the initial release of their OS/2 database package DBExpert. This program allows users to graphically create forms, reports and front ends to existing databases through use of a point and click interface. Reading database formats such as dBase, DB2/2 and Oracle this program features Query-by-Example query setup and WYSIWYG

previews of reports. The price of this application is \$495. For more information call Designer Software at (303) 858-0200, fax (303) 858-3313.

READER SERVICE NO.



between the OS/2 and Windows versions of 123 and Freelance Graphics, and a REXX enabler for 123. The Value Pack is available from Lotus for \$10. Call (800) 872-3387.

READER SERVICE NO. 160

DeskMan/2 1.51

Desktop utility

Development Technologies has released an updated version of their DeskMan/2 utilities that is specially made to support OS/2 Warp 3.0. This update will also support OS/2 2.x and features a number of stability and performance enhancements. This version also features OS/2 Warp-specific backup support for animated folder icons and the launch pad, more command-line options, and better CID support. DeskMan/2 sells

for \$79.95 with free upgrades for all Deskman/2 users. Call Development Technologies at (803) 790-9230 or fax (803) 738-0218.

READER SERVICE NO. 161

Fontastic!

500 font CD-ROM for OS/2

Bitstream has announced a special release of their 500-font CD-ROM for OS/2. The disc contains the same TrueType and Postscript Type 1 fonts as the Windows version, but the documentation was rewritten to help you install the fonts under OS/2. The CD-ROM is available for an introductory price of \$29.95. After February 28, 1995, the price will be \$49.95. Call Bitstream at (800) 522-3668, (617) 497-6222, or fax (617) 868-0784.

READER SERVICE NO. 162

Welcome New REXX Users

A GUIDED TOUR OF REXX—PLUS AN UNDOCUMENTED OS/2 WARP FEATURE BY DICK GORAN



With the huge increase in new OS/2 users due to the excitement and popularity of OS/2 Warp 3.0, I have decided to discuss some of the basics of using REXX to benefit users who have never had any exposure to the language. My apologies to the seasoned REXX veterans, but I have included a sidebar that covers an undocumented facility in OS/2 Warp that might affect their REXX programs.

REXX is a very powerful interpreted language that origi-

nated in the IBM mainframe world—specifically VM /CMS. It was created by Mike Cowlshaw of the IBM Hursley Labs and was first released in the early 1980s. REXX has gained wide acceptance since then. It is now available on

all IBM operating system platforms and, except for those functions designed uniquely for a given platform, will run on every IBM operating system including PCs and mainframes.

OS/2 REXX programs have a file extension of *.cmd*, as do OS/2 procedural command files (like *.bat* files in DOS). However, what distinguishes a *.cmd* file is that a REXX program must begin with a slash asterisk pair of characters (/*), beginning in position one of line one of the file. The absence

Fragment 1: Sample REXX program.

```
/* */
say 'Hello'
exit
```

Listing 1: List *config.sys* on *lpt1*.

```
/* 9503LS02.CMD - List CONFIG.SYS on LPT1 */
Say 'Listing CONFIG.SYS on LPT1'
Say 'Please enter drive letter of CONFIG.SYS'
pull drive_letter

config_sys_file_name = drive_letter || ':\CONFIG.SYS'
if STREAM( config_sys_file_name, 'C', 'QUERY EXISTS' ) = '' then
do
    say 'Unable to locate' config_sys_file_name
    exit
end

form_feed = D2C(12)
input_line_count = 0
do while LINES(config_sys_file_name) > 0
    input_line = LINEIN(config_sys_file_name)
    input_line_count = input_line_count + 1
    call LINEOUT 'LPT1', input_line
end
call CHAROUT 'LPT1', form_feed

call STREAM config_sys_file_name, 'C', 'CLOSE'
call STREAM 'LPT1', 'C', 'CLOSE'

Say input_line_count || ' lines listed'
exit

/* 0001 */
/* 0002 */
/* 0003 */
/* 0004 */
/* 0005 */
/* 0006 */
/* 0007 */
/* 0008 */
/* 0009 */
/* 0010 */
/* 0011 */
/* 0012 */
/* 0013 */
/* 0014 */
/* 0015 */
/* 0016 */
/* 0017 */
/* 0018 */
/* 0019 */
/* 0020 */
/* 0021 */
/* 0022 */
/* 0023 */
/* 0024 */
/* 0025 */
/* 0026 */
```


of the "slashterisk" pair will result in the command processor program (*cmd.exe*) processing the statements contained in the file as if they were simply command-line instructions. When the *.cmd* file begins with a /*, *cmd.exe* starts the REXX interpreter and passes control to it. REXX programs can be run in either windowed or full-screen sessions. REXX programs can also be **started** or run **detached**.

If REXX programs are going to be run in a graphics Presentation Manager session, they must be started with the PMREXX program if they issue any input/output (I/O) commands to or from the console (monitor or keyboard).

Because REXX is a free-form language, you can write programs with it very quickly and easily. Fragment 1 contains the usual example that you see as

an introductory REXX sample program.

If you create a *.cmd* file with the three lines from Fragment 1 and enter the name of that *.cmd* file on a command line, you will have written and executed your first REXX program.

Listing 1 contains a more practical program whose function is to ask for the letter of the drive where the *config.sys* file can be found. It then proceeds to read each line in *config.sys*, increment a count of the number of lines that have been read, and write that line to the printer attached to *lpt1*. Finally, it does the housekeeping of closing the two files that were used and writes the total of the number of lines that had been read to the console. It is possible to use a REXX function to automatically determine the drive that contains *config.sys*, but I have intentionally not used it here. A copy of

this program can be found on CompuServe, OS2aven, Library 2 as *rxls04.cmd* or can be ftp'd from [ftp.netcom.com:/pub/dg/dgoran](ftp://ftp.netcom.com/pub/dg/dgoran) as *9503ls02.cmd*.

Table 1 contains an explanation of the instructions that are used in the program shown in Listing 1. The blank lines that contain only a sequence number in Table 1 were inserted to make the program more readable.

Writing a simple REXX program is not a difficult task. The secret to making REXX really perform for you is knowing the available functions that are at your disposal. The on-line REXX information file contains definitions of most of the functions contained in OS/2 SAA REXX and its REXXUTIL external function module.

Because of its simplicity, REXX is very easy to abuse. I recommend to

Table 1: Explanation of instructions from Listing 1.

Line Number	Explanation
0001	The presence of a comment, beginning in position 1 of line 1, tells <i>cmd.exe</i> that it is a REXX program instead of a procedural <i>.cmd</i> batch command file.
0002-0004	As in the "Say Hello" example, these two lines write messages to the console. The PULL instruction then waits for you to key in a letter and press <Enter>. The value that is entered is assigned to the variable drive_letter. An assignment clause is one of the most commonly used types of REXX clauses. A variable is a symbol whose value can be changed during the course of execution of a REXX program.
0006	Another assignment is made, only this time it involves assigning two values together to the variable config_sys_file_name or concatenating the value that is contained in the variable drive_letter to the value of ' :CONFIG.SYS ' (a "literal"). If you had entered a lower or uppercase c when the program asked for a response, the resulting value in config_sys_file_name would be ':c:CONFIG.SYS'. The apostrophes, or loosely called quotes, are not included in the actual value. The PULL instruction has an implied function of uppercasing the value when it is read from the keyboard.
0007-0011	This group introduces a number of REXX instructions and clauses. Its purpose is to check to make sure that the file actually exists. If it does not, the user is informed by a message that reads: "Unable to locate ?:\CONFIG.SYS." The question mark in the message represents the letter that the user entered. The program is then terminated.
0007	REXX has a rich collection of functions that are used for different purposes. STREAM() is one such function and it has a number of options that make it perform differently. In this case, we are using the function in an expression and testing the evaluated expression to see if it is equal to a null (the value that is returned if the file does not exist). This function is similar to using IF ... EXISTS in a DOS or OS/2 batch command file. The test is made by using the IF THEN combination and the group of instructions between the DO and END instructions are executed if the evaluation is equal or true.
0008-0009	A message that indicates the reason that the program is terminating. It is written to the console and control is returned to <i>cmd.exe</i> with the EXIT instruction.
0013-0014	The two assignments place the value of a printer form feed and a numeric value of zero in the variables form_feed and input_line_count , respectively. D2C() is another built-in REXX function. It is used to convert a decimal value to its actual character value. In this case, a decimal value of 12 results in the pre-defined form-feed control character of '0C'x.

Table 1: Explanation of instructions from Listing 1 (cont'd).

Line Number	Explanation
0015-0019	This group of instructions, bounded by DO and END instructions (similar to the group in lines 0008 - 0011) reads a line from <i>config.sys</i> and assigns the value of that line to the variable input_line , increments a tally of the number of lines written, and writes that line to the printer. The use of the LINES() function in the conditional statement in line 0015 causes this group of instructions to iterate until all of the lines in <i>config.sys</i> have been processed. At that time, the DO loop is complete.
0020	To keep the listing neat, a form-feed character is sent to the printer to cause a continuous forms printer to skip up to the beginning of a new page or a laser printer to eject the printed page. Note that the actual printed line is sent to the printer with the LINEOUT() function, whereas the form-feed character is sent to the printer with the CHAROUT() function. The difference is that LINEOUT() causes the line to be written to the output file or device with a terminating carriage return/line-feed pair (CR/LF) combination. CHAROUT() sends only the specified characters without appending anything to the data.
0022-0023	The housekeeping function of closing both the input and output files (yes, the printer is handled just like a disk file, except that a form feed will not cause your hard drive to skip to a new page).
0025-0026	The number of lines that were processed is written to the console. Line 0025 uses abuttal concatenation to cause the two values, the variable input_line_count , and the literal value to be written to the console. The use of the double bar or abuttal concatenation prevents a space from being inserted between two values, which is what would occur if the were not there.

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Undocumented OS/2 Warp function

A pair of environment variables were added to Warp that are not contained in the Warp on-line documentation. **SET BeginLibPath=** and **SET EndLibPath=** provide the capability to dynamically alter the current session's value of **LIBPATH** as it is defined in *config.sys*. Both **SET** statements are followed by one or more path names that are to be inserted into the beginning and end of the **LIBPATH** string for the current session, respectively.

These two environment variables are handled uniquely by *cmd.exe*. This fact has special significance to a REXX programmer who wants to either set or retrieve and parse these two variables.

Although both of the environment variables can be set using the **VALUE()** function, they will not serve their intended purpose because the **VALUE()** function was not updated to include the special use that was intended for these values. Therefore, contrary to the recommended use of a REXX function to set an external value (instead of passing the equivalent command to *cmd.exe*), you have no alternative if it is necessary to set either environment variable from within a REXX program other than to pass the **SET** command to *cmd.exe*.

The string that is returned from **SET BEGINLIBPATH** will not contain any spaces before or after the equal sign (**SET BEGINLIBPATH=?\...**), whereas the result returned by a **SET** command by itself will contain a space both before and after the equal sign (**SET BEGINLIBPATH = ?\...**).

both new REXX programmers and veterans that they take the extra time and effort to write all of their REXX programs as if they were intended to be

read by others. Use meaningful labels for variables instead of abbreviations that will be meaningful to you but will be undecipherable by anyone else. Use

appropriate spacing and column alignment to make your program more pleasant to the eye. This practice makes it more comfortable for a stranger to follow the logic of your program. Don't skip on comments that provide an overview for groups of related instructions. Your programming style can be as important as your program functionality.

In future columns, I will cover many of the features that experienced REXX users take for granted, in addition to some of the lesser-known capabilities of REXX and the external function packages available for OS/2 REXX use.

Dick Goran is the author of the REXX Reference Summary Handbook, an OS/2 Reference. He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He teaches OS/2 REXX to corporate clients and lectures on OS/2. He can be reached via e-mail at 71154.2002@compuserve.com.

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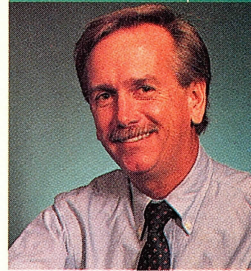
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OS/2 CD-ROMs

SOFTWARE BY THE GIGABYTE BY DICK CONKLIN



Our latest list of OS/2 CD-ROMs is considerably longer than last year's. A year ago, CD-ROMs were used only for a few niche applications that had very large storage requirements. Today, it seems that everyone is getting on the bandwagon. CD-ROMs are one of those technical innovations (like Pentium systems, multimedia games, and 14.4K

modems) that have quickly become commonplace.

The CD-ROM of today won't completely replace the floppy disk because CD-ROMs are still read-only media. They work well for distributing large quantities of software (at 650MB or more per disc), but can't be used to back-up your system. Will we have 650MB floppy disks or read/write CDs in five

years? We'll have to wait and see.

In addition to the giga-volumes of software, shareware, and freeware available on CD-ROM, you'll find that many OS/2 books now come with a CD-ROM. In addition, seminar proceedings are distributed to attendees on CD-ROMs.

I have listed the CD-ROM resources that are of interest to OS/2 users and contain OS/2-specific data.

Table 1: OS/2 CD-ROM Directory.

CD-ROM Company name	Contact Information	Description	Price
Dr. OS/2 Gold I Accurate Research Inc.	(800) 799-8802 (408) 748-9988 Fax: (408) 748-9989 BBS: (408) 453-6250	More than 1,400 shareware files for OS/2 2.x and Warp. Includes communications programs, databases, desktops, drivers, graphics, wallpaper, utilities, and word processors.	\$29.95
PlayMate for OS/2 Accurate Research Inc.	(800) 799-8802 (408) 748-9988 Fax: (408) 748-9989 BBS: (408) 453-6250	100 ready-to-play games that require no installation. Includes 3D VR, adventure, battle, casino, arcade, sports, puzzles, chess, strategy games, and more.	\$24.95
OS/2 Mate Accurate Research Inc.	(800) 799-8802 (408) 748-9988 Fax: (408) 748-9989 BBS: (408) 453-6250	More than 2,000 utility shareware programs, spreadsheets, bitmaps, communications, editors, icons, BBS, and more.	\$24.95
500 fonts CD for OS/2 Bitstream Inc.	(617) 497-6222 (800) 522-3668 Fax: (617) 868-0784	Contains all of the TrueType and Type 1 fonts that are included in the Windows version of the disk with rewritten documentation to help install the fonts under OS/2. All fonts are unlocked and uncompressed.	\$29.95 until March 1995 (\$49.95 after that)

Table 1: OS/2 CD-ROM Directory (cont'd).

CD-ROM Company name	Contact Information	Description	Price
OS/2 Utilities CD-ROM (13th Edition) EMS Professional Shareware	(301) 924-3594 Fax: (301) 963-2708 E-mail: eengelmann@world-bank.org	703 shareware files in ZIP format, PC product database, and a search engine. Three discs.	\$25.00
Fonts For You Fantazia Concepts	(800) 951-0877 (216) 951-9241 Fax: (216) 951-9241 E-mail: FantaziaC@AOL.Com	More than 2,500 TrueType and 2,500 Type 1 original fonts that are unlocked and uncompressed. Fonts are categorized by style: Roman, Hollow, Jazzy, Unique, Spiked, Warped, Script, Basic, and so on. Includes a reference manual that shows all fonts.	\$49.99
Font Elegance Fantazia Concepts	(800) 951-0877 (216) 951-9241 Fax: (216) 951-9241 E-mail: FantaziaC@AOL.Com	1,000 TrueType and 1,000 Type 1 original fonts that are unlocked and uncompressed. Fonts are categorized by style: Roman, Script, Basic, Warped, Hollow, and so on.	\$29.95
Developer's Connection for OS/2 (DevCon) IBM Corp.	(800) 633-8266 E-mail: DevCon@Vnet.IBM.Com	Contains OS/2 development tools, utilities, demonstrations, documentation, and sample code. Newsletter provides accompanying information, book reviews, questions and answers, tips and techniques, and information about IBM strategy and plans. You can access technical support through CompuServe, Internet and IBM's OS/2 BBS.	\$199 for a four-issue subscription (\$119 for members of IBM's Developer Assistance Program)
Developer Connection Device Driver Kit. IBM Corp.	(800) 633-8266. E-mail: DevCon@Vnet.IBM.Com	Includes Developer Connection for OS/2 (see previous entry) and an additional CD-ROM that contains complete buildable source code of actual OS/2 device drivers and samples.	\$299 (\$179 for members of IBM's Developer Assistance Program)
IBM Developer Assistance Program CD-ROM IBM Corp. Europe	(44) 1256-343074 Fax: (44) 1256-336778 E-mail: EMEADAP@Vnet.IBM.Com	Product announcements, OS/2 APAR (bug) database, application-program generators, product demonstrations, device drivers, OS/2 (cont'd)	Free with DAP membership.

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CD-ROM Company name	Contact Information	Description	Price
IBM Developer Assistance Program CD-ROM (cont'd)		Electronic Developer's Magazine (EDM/2), product reviews, IBMNet and DAP customer forums, IBM support information, IBM newsletters, IBM Redbooks, OS/2 sample programs, tips & techniques, specification sheets, toolkits, and white papers.	
IBM Technical Connection Personal Software IBM Corp.	(800) 992-4777	Service tips and technical information for OS/2, DOS, and LAN Server products. Help-desk personnel, end-users, and developers can obtain answers to questions. Solutions database includes descriptions of known problems and solutions. Also includes AskPSP expert-system (cont'd)	\$299 for a monthly subscription, \$119 for a quarterly subscription, and \$ 59 for a single copy.

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OS/2 Professional CD-ROM I.F. Computer Resources	(800) 672-5945 (612) 823-6255	More than 1,200 OS/2 shareware, freeware, and demoware programs, tools, utilities, and other resources.	\$25
Hobbes OS/2 Archived Walnut Creek CD-ROM	(800) 786-9907 (510) 674-0783 Fax: (510) 674-0821 E-mail: Orders@CDROM.Com WWW: HTTP://WWW.CDROM.Com	3,000 OS/2 shareware and freeware files from Internet's <i>hobbes.cdrom.com</i> archive. Includes application demonstrations, shell replacements, icons, utilities, drivers, editors, spell checkers, programming tools, documentation, games, service packs, and CSDs. Files are in a compressed format.	\$29.95
Hobbes Ready-to-Run Walnut Creek CD-ROM	(800) 786-9907 (510) 674-0783 Fax: (510) 674-0821 E-mail: Orders@CDROM.Com WWW: HTTP://WWW.CDROM.Com	Uncompressed OS/2 applications. Includes Emacs 19.25, EMX08h, gcc 2.5.8, TeX, ghostscript 2.6.1, GNU utility suite, multimedia AVI movies, service packs, and more.	\$39.95
La Coleccion Walnut Creek CD-ROM	Tel: (800) 786-9907 (510) 674-0783 Fax: (510) 674-0821	5,000 shareware files from Argentina's New Age BBS that are indexed in 50 (cont'd)	\$39.95

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La Coleccion (cont'd)	E-mail: Orders@CDROM.Com WWW: HTTP://WWW.CDROM.Com	directories with English and Spanish descriptions.	
Official POV-Ray CD-ROM Walnut Creek CD-ROM	(800) 786-9907 (510) 674-0783 Fax: (510) 674-0821 E-mail: Orders@CDROM.Com WWW: HTTP://WWW.CDROM.Com	A compilation of images, scene source, program source, utilities, and tips on POV-Ray and three-dimensional graphics from Internet and CompuServe. Includes source and OS/2 binaries for Persistence of Vision version 2.2 (POV-Ray), the freeware raytracer for people who want to create their own images.	\$39.95

Dick Conklin is a contributing editor to OS/2 Magazine and author of three OS/2 books. He can be reached at CompuServe 76711,1005 or Internet os2mag@vnet.ibm.com.

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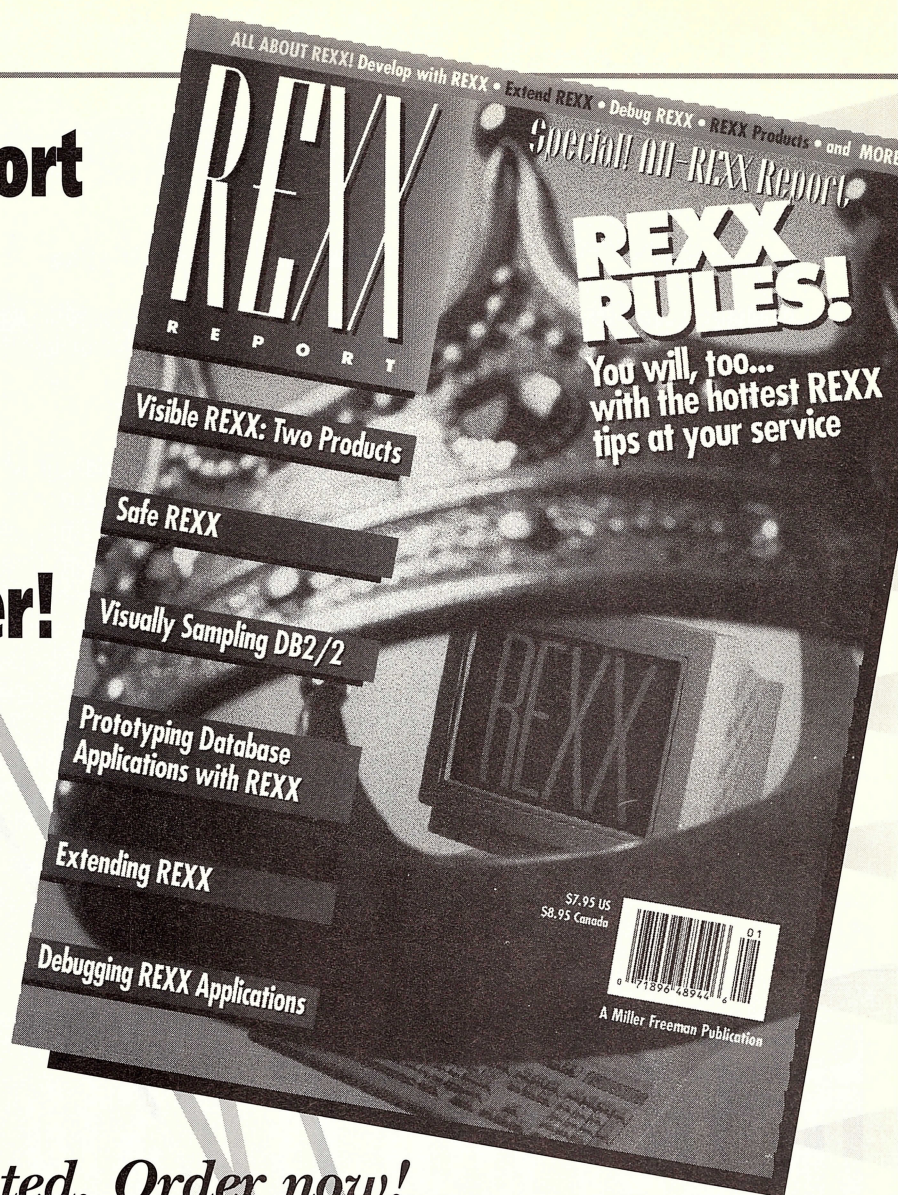
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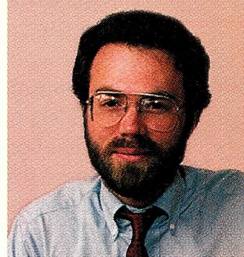
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The Object of Objects

WHY YOU CAN ALWAYS GET AN OBJECT MENU
IN THE WORKPLACE SHELL BY MARK MINASI



Since I started teaching OS/2 classes, I have found that the most common causes of confusion are OS/2's different object types. What is an object? What does "object oriented" mean to OS/2 users? What is a program object? Is it the same as a program? Where do objects reside?

OS/2's object orientation is one of its great strengths. Everything you look at in OS/2 is an object, by default. Every file is an object, at least when viewed through one of the Drives objects in the Drives folder. Before I go into that subject, however, it's worth asking the question, what exactly is an object?

The story of the object

Objects come from a programming concept that's been around for more than 10 years. I first encountered it in a 1988 vintage copy of Turbo Pascal. Originally, computer languages used very simple types of variables—areas in memory that were used to store information that was being worked on. For example, if a payroll program is figuring out your weekly pay, it multiplies your hourly rate by the number of hours you worked, which leads to a total payment amount. The hours worked, hourly pay, and resulting dollar amount stay in the computer's memory as a variable.

Programmers soon discovered that variables were often linked. For example, a programmer who is writing a payroll program would soon discover that some variables that were called name, social security number, hours worked, and hourly pay were related in the fact

It's worth
asking the question,
what exactly is an
object?

that they were part of a description of something called an employee. Someone reasoned that it would be a good idea to wrap up all the variables that were associated with this employee and give them one name. The wrapped-up set of variables was given the name "record type."

Now, whenever programmers build a new kind of variable (or a record), they also have to write some small programs, known as procedures, to act as housekeeping routines. Continuing with the example of the employee-type record, at minimum, a programmer would have to write a procedure to create a new blank employee record just as a personnel officer in an employment office would use a new employee description form to enter a new employee into the company's files.

One of the most significant features that object orientation brings to programming is the idea of encapsulation, which means that the procedures are carried around with the data-record types. That way, when another programmer tries to reuse the first programmer's code, the object (which is in

a library of objects) not only defines a common thing to be manipulated, like a description of an employee, but it also defines and includes programs that will work with the record.

Inheritance is another handy feature of objects. Suppose you're not writing a payroll program. Suppose instead that you're writing the 10,000th Star Trek spin-off computer game. You want the game to include battles in space, because, after all, that's often the best part of the show, so you need to model ships for the Romulans, Ferengi, Klingons, Cardassians, and anyone else your player might run up against, as well as the player's own Enterprise.

These ships are different in many ways, but they are more similar than different. They all have a faster-than-light drive of some kind, phasers, photon torpedoes, shields, and impulse power. The common characteristic is that they're all ships. The whole programming task would be easier if you could just build an object type called "ship" and write the routines that are associated with it, such as move ship, fire weapons, take hits, and so on. You would then build new objects called "Romulan," "Ferengi," and so on by merely defining them as type "ship" and adding cloaking devices, greedy captains, and anything else you can think of.

OS/2 and Windows objects

You can experience the power of objects under OS/2 in features, such as folders, the pop-up menu, drag and drop, and Settings notebooks. The

Windows Program Manager shows things that look like folders, but you can't drag them into other folders in the Program Manager because they're not actually folders. They are only made from special code that was written to make them look like folders. But, because the code wasn't written with objects, it would have been a chore for the programmers to write the code for those folders to allow users to put folders inside of folders. So, basically, you can't. Some things can be dragged onto other things in Windows (you can drag some file types onto the Print Manager to print them, for example), but it's not a general-purpose feature. If you drag a file onto the Ami Pro icon, for example, it disappears into the icon, but Ami Pro doesn't bring up the file.

Under OS/2, programmers don't have to remember to build the pop-up menu. It's automatically part of the object, because a base low-level object type was built into OS/2 that includes a pop-up menu and a Settings notebook (which probably only includes the General page). The Windows Program Manager icon has no life outside the Program Manager. You can't drag it outside the Program Manager window because the icon is only useful within the Program Manager. OS/2's icons look like Windows icons, but have a broader use than their Windows cousins.

An icon under OS/2 represents an object. You are most likely to work with three object types under OS/2, including folder objects, datafile objects, and program objects. A folder object is simply an object that contains other objects. Folders are implemented in the Workplace Shell as directories. For example, the Desktop is a directory by the name of `c:\desktop` (unless you have OS/2 on another drive, of course). The OS/2 System folder on the desktop is actually `c:\desktop\os!2_sys`, the Information folder is `c:\desktop\informat`, and the Templates folder is `c:\desktop\templat`. (I am assuming that you're using a FAT-based disk. HPFS users will have more descriptive names on their directories.)

An experiment

Try the following experiment to see how subdirectories and folders interact.

Some things CAN BE DRAGGED ONTO OTHER THINGS IN WINDOWS (YOU CAN DRAG SOME FILE TYPES ONTO THE PRINT MANAGER TO PRINT THEM, FOR EXAMPLE), BUT IT'S NOT A GENERAL-PURPOSE FEATURE.

- Open an OS/2 comand window.
- Type `md c:\desktop\myfolder`. If you've installed OS/2 on a drive other than `c:`, substitute that drive letter.
- You can make sure your new folder was actually created by typing `dir c:\desktop /od` to show the directories in the Desktop. You'll see the *informat*, *template*, and *os!2_sys* directories in addition to the new *myfolder*.
- Wait a few minutes and check your desktop. A folder should have appeared with the generic folder icon and the name *myfolder*.
- Drag *myfolder* to the Shredder to get rid of it.
- Now type `dir c:\desktop /od` again and you'll see that *myfolder* is gone.

The Workplace Shell has the predefined folder object class, **WP_FOLDER**. The folder class is automatically associated with any directory. A directory has two aspects: its actual directory structure and the object class associated with it. I distinguish the two because the actual directory structure can exist apart from the Workplace Shell object that corresponds to it. For example, you can build a custom icon and attach it to this folder or assign a long descriptive name to that folder. That characteristic will be contained inside the folder object. (More specifically, it resides within the extended attributes of the folder, but that's a story for another day.) If you reboot your system under DOS, DOS will see that the directory exists, but the operating system will

remain ignorant of the folder's long name or its icon.

The second object type that you'll encounter is a datafile object. Similar to a folder, a datafile object would exist without the Workplace Shell. Typically, you'll only see datafile objects when you open up the Drives folder and look at drive *a:*, *b:*, or *c:*. Similar to folders, drives can have icons or long names associated with them.

To see how object orientation works, follow these instructions: take a look at any data file, right-click it to bring up its pop-up menu, and choose Settings. You'll see that any given data file has a Settings notebook with tabs for Type, Menu, File, and General. The programmers of the OS/2 desktop didn't have to write a special routine to do that. The base OS/2 object contains a Settings notebook so that every other kind of object, including objects that relate to things that aren't OS/2 creations (for example, the data files that have existed in computers since decades before OS/2 appeared), gets a Settings notebook.

Another benefit of making data files into data-file objects is, of course, that you can associate a file with a particular application. Objects allow for a more general association than the old "every file ending with *.sam* is an Ami Pro file" that has existed in PC operating systems for more than a decade.

Mark Minasi has been a consultant and educator in the fields of advanced PC operating platforms and PC technology since 1984. He is a contributing editor for Compute, BYTE, and OS/2 Magazine. You can contact him at CompuServe 71571,264 or Internet mminasi@access.digex.net.

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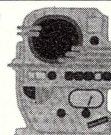
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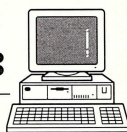
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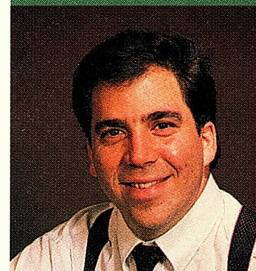
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Customizing <Alt+F1>

STARTUP, TUTORIAL CUSTOMIZATION,
FAST SETTINGS, AND MORE. BY DAVID REICH



<ALT+F1>

With the release of OS/2 Warp 3.0, some ideas and concepts that were previously implemented as renegade functions in earlier versions of OS/2 have been polished up. One such function is <Alt+F1> processing. In OS/2 2.0, 2.1 and 2.11 you could recreate a default Workplace Shell desktop by pressing and holding the <Alt> key with <F1> as soon as the computer completed its power-on self test (POST) or as soon as you acknowledged the Boot Manager menu. The system would then restore your Workplace Shell desktop to the configuration that existed immediately after you installed the system. It also replaced the *config.sys* file with the one in the \os2\install directory.

Because it's often useful to archive and restore previous desktop configurations, OS/2 Warp provides advanced <Alt+F1> functionality. When you boot an OS/2 Warp system (immediately after the POST, or when the Boot Manager menu disappears), you will see a white box with OS/2 written next to it in the upper-left corner of the screen. If you press the <Alt+F1> key sequence while this box is displayed, the system will display an archive retrieval/maintenance menu.

This menu gives you several choices: you can press the <Esc> key to continue booting the system from the current *config.sys* file and the current Workplace Shell desktop configuration, you can type the letter c to go to a

Because it's
often useful to archive
and restore
previous desktop con-
figurations, OS/2 Warp
provides advanced
<Alt+F1> functionality.

command prompt where you can copy or move files, manually restore files, or edit your current *config.sys* file (OS/2 now has a small full-screen editor for this purpose called *tedit.exe*), or you can perform other operations. If you type the letter v, it will reset your video configuration to standard VGA, which is useful if you have problems with your video configuration or if you changed video cards and need to install the new video driver. You can also type the letter m, which will bring up a maintenance desktop that will allow you to perform other operations. You can also type the letter x, which will restore an archive of your desktop if you have created one.

OS/2 Warp provides considerably more than the simple <Alt+F1> function of prior versions, which was not even documented. Not only is this

function available, but it is extendable and configurable. The menuing system works with several files that reside in the \os2\boot directory on your boot drive. The first file is *altf1.cmd*. This command file is called when the menu is displayed and you type an appropriate letter. When you look at *altf1.cmd*, you will notice that it is a straight batch-command language file. It is not a REXX program file because, when this command file is run, only a bare-bones system is running. The REXX interpreter and functions are not available.

The other three key files are: *altf1bot.scr*, *altf1mid.scr*, and *altf1top.scr*. These files only contain text. And, as the names imply, they make up the menu screen you see when you press <Alt+F1> at the right time. The screen is divided into thirds for the purpose of this menu and each file represents one third. You can view them by using the **type** command or by using a text editor.

Note that these files only hold the text that appears on the menu. Putting new menu choices in the text has no effect on the letters that will be accepted as input.

You can customize what is shown when <Alt+F1> is pressed (which you have probably already figured out), by simply changing the text in any or all of the .scr files. This step is only the first part of <Alt+F1> customization. Let's say that you want to add some custom menu choices or you just want to remove some of the choices that are supplied by the system. To remove system choices, simply edit the appropriate .scr file and remove the choice(s). To

prevent a user from accidentally selecting a (formerly) valid choice, which will cause the system to take the default action, make sure to edit the appropriate part of *altf1.cmd*.

At this point, things might get a little confusing. It would be reasonable to assume that all you would have to do is add new text for new choices in the *.scr* files and add checks for other letters that would be pressed in *altf1.cmd*. The OS/2 system designers have set it up so that *altf1.cmd* is only called when you press **v**, **c**, **m** or **x**. However, a mechanism exists by which you can add new menu choices.

The available options allow you to specify a custom *config.sys* file and/or run a specific *.cmd* file. It's all in the name. Let's look at an example. Say, for example, you have a laptop computer that has a Token Ring LAN PCMCIA card in it. If you start your system on an airplane, you are obviously not connected to the LAN, which will cause you to get LAN errors. Likewise, when you are at work and connected to the network, you don't want to boot up with a *config.sys* file that does not have the LAN drivers because you were not connected the last time you booted.

You could create two different versions of the same *config.sys* file—one with the LAN drivers and the other without. You could call one *config.a* (for away) and the other *config.l* (for LAN). You should then update the *.scr* file(s) with the indicators to press **l** for LAN and **a** for away. The system will pick the *config.letter* file that is appropriate for the selection made. You can make this process simpler by choosing the mode that is more common for you and only creating a special *config.sys* for the other.

For example, if you are connecting to the LAN more often, keep your LAN drivers in *config.sys*. Create a special *config.a* without LAN drivers for when you are away. Then, only use **<Alt+F1>** and the **a** selection when you are away and let the *config.sys* file be used at all other times. Another important note is that any *config.letter* file must be located in the *\os2\boot* directory of your boot drive.

It is also possible to create custom *.cmd* files. If you create a file called *altf1x.cmd*, where **x** is any letter (other than the **v**, **m**, **c** or **x** that are already defined by the system), pressing that letter at the **<Alt+F1>** menu will execute that command file. In this case, you could update the *.scr* file(s) with text indicating the letters for the command files. Note that these command files must also reside in the *\os2\boot* directory of the boot drive. In addition, unlike in the previous discussion of

You can see that many options are available to help you to tailor the start-up "exception" processing to your specific situation. You can use this utility for situations, such as the one mentioned in the LAN example, for emergencies, to fix damaged files, or to reconfigure parts of the system.

TUTORIAL SWITCHES

Q: The OS/2 Warp Tutorial contains so much information that I could never get through it all in one sitting. Can I close the tutorial and somehow start where I left off?

A: Actually, you can use several command-line switches on the OS/2 Warp tutorial. You can specify these command-line switches when starting the

tutorial from an OS/2 Command Prompt (by typing **tutorial** and pressing **<Enter>**). However, it is easier to put the switches in the Parameters field of the program-reference object for the tutorial.

Open the Settings notebook for the Tutorial object by clicking with mouse-button two on the object to display the context menu. Select Settings. In the Settings notebook, you will see the Program page and

the Parameters field. Click on that field and type in the parameters. The tutorial will respond to the parameters as outlined in Table 1.

You can use a combination of the parameters (separated by a space in the Parameters field), but only if they make sense. For example, you might want to use **-resume** with **-expert** to go back to wherever you left off and show the expert tips as the default.

Table 1: Tutorial parameters.

Parameter	Explanation
-r (or -resume)	Will keep track of where you were when you last closed the tutorial. The next time you open it with the Tutorial object, it will return to this spot.
-e (or -expert)	Will cause the tutorial to default to displaying the expert tips for the various actions.
-w (or -windows)	Will cause the tutorial to default to displaying the Microsoft Windows equivalent tips for the various actions.
-m (or -minimize)	Will start the tutorial in a minimized state.
-16	Will cause the tutorial to use only 16-color bitmaps.
-n (or -nostretch)	Will prevent the tutorial program from stretching bitmaps if you change window sizes and will, instead, keep them in their original perspective size.

booting from different *config.sys* files, the command files are run and the system will not continue booting automatically. It is possible to continue the boot sequence by pressing the **<Esc>** key. If you want to do some command-file processing, I recommend that you echo instructions to the screen at the end of the command file, telling users to press the **<Esc>** key if they want the system to continue booting.

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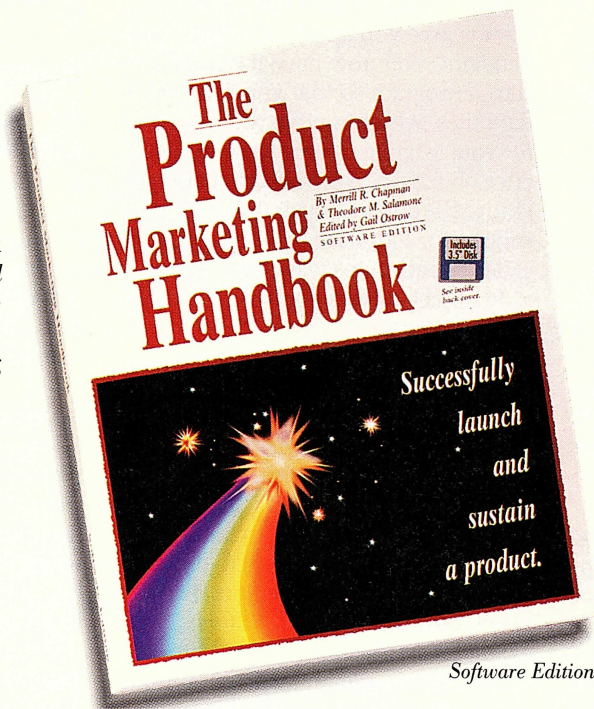
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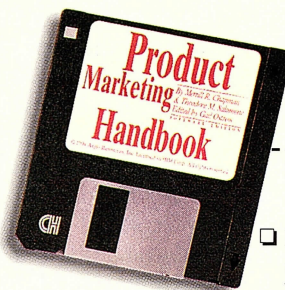
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FAST SETTINGS

Q: Is there a faster way to bring up the Settings notebook than having to go to the object, click with mouse-button two, and select Settings from the menu?

A: You can go quickly to the Settings notebook by holding down the <Alt> key while doubleclicking with mouse-button one on the object whose Settings notebook you want to work with.

ASSOCIATIONS

Q: You've mentioned associations in several columns. What are they, how do they work, and how can I best use them?

A: Before I explain what associations are and why they exist in the system, we must first discuss the user interface and the mindset behind it.

The OS/2 Workplace Shell is designed to work the way people work—with objects. People work with printers, folders, documents, and other types of objects. In the earlier DOS and Windows days, you would open an application, feed it a data file, manipulate it, and tell it to spit it back out. OS/2 allows you to open a document, manipulate it, and then close it. If you want to put it someplace else, you drag it there and drop it. If you want to print it, you drop it onto the printer. DOS and Windows are application-oriented and OS/2 is object-oriented.

The vast majority of applications—DOS, Windows, and even most OS/2 applications—are not fully object-oriented, especially in the way the data files are manipulated by users. OS/2 has associations to help bridge this gap until more applications are integrated with the Workplace Shell.

In the Workplace Shell, you have data-file objects, program-file objects, palette objects, the mouse object, the Launch Pad object, and other objects. Many of the things you see on the

screen are program-reference objects. Unlike a program-file object, which is an object that represents the program's executable file, a program-reference object is an abstract object that is a pointer to a program, which is what you set on the Program page in the Settings notebook.

Of course, the only thing this setup does is give you application-oriented behavior. You now have the means to start a program so that you can feed it data files, which is what Migrate does for you. Migrate creates program-reference objects with settings that are specific to the application as defined in the migration database. The tool that is called Associations was created to provide object-oriented behavior in this environment.

An association exists between a data-file type and an application program. You use the Association page to associate types to a program. The system comes with a set of predefined types for associations. Programs that are Workplace Shell-aware have the ability to add new types to the system through the Association page. You can also add types, basically with file filters. Some examples are *.doc or *.txt for editors.

When you add an association for a type or file filter to an application, you are adding the ability to open the data file or document object. The system will start the application and load the data file for the file that the object you opened represents. Essentially, you are using the association as a tool to make an application-oriented program more object-oriented.

A concrete example can be shown with the Enhanced Editor. If you write letters and, for example, you call them *whatever.let*, you can go to the Productivity Folder and find the program-reference object for the Enhanced Editor. Open the settings for that object and click on the Association page. In the "New Name" field, enter *.let. Click on Add. These steps enable you to add an association for any file (or more to the point, any data-file object that represents a file with the .let extension) with the Enhanced Editor. Now, any time you open a data-file object that represents a file with the .let extension, the system will start the Enhanced

Editor and load in the file based on the object that was opened. You now have object-oriented behavior.

Given the complexity of OS/2 and the shell and the fact that OS/2 runs OS/2 as well as DOS and Windows programs, you can create a more object-oriented system, even with non-OS/2 programs.

FAT OR HPFS

Q: I have a drive that is currently formatted with the FAT file system. I'd like to reformat it to HPFS. When I type format d:, it says the file system is FAT and it reformats the drive as FAT. How can I switch this partition over to HPFS?

A: First (this goes without saying, but I'll say it anyway), be sure to backup whatever data is on the drive that you want to save. Formatting will wipe out the data on the partition, especially when you are switching file systems. If you have a FAT drive that you want to reformat to HPFS, type:

```
FORMAT X: /FS:HPFS
```

X stands for the drive you want to format. Likewise, if you have an HPFS drive that you want to reformat to FAT, you can type:

```
FORMAT X: /FS:FAT
```

If you don't enter the /fs: parameter, the **format** program will default to reformatting the drive with the file system that is currently on the drive. If no file system exists (for example, if you just repartitioned a physical drive) and you do not specify a file system, **format** will assume that you want FAT.

David Reich, a contributing editor to OS/2 Magazine and author of Designing OS/2 Applications, has been with the OS/2 development team since 1987. David is interested in your questions and suggestions. Contact him at CompuServe 76711,632 or Internet speedracer@vnet.ibm.com.

End Notes cont'd from p. 72

of the seamful, ill-documented DOS/Windows interface, not to mention the agonizingly spasmodic evolution of the Intel 80x86 family, you can probably appreciate the obstacles. The remarkable impossible solution was the Win-OS/2 environment. Note, in passing, that *Win* offers a felicitous double-entendre. I should also mention that Win-OS/2 is an ongoing victory, because each, dare I say "arbitrary," API tweak by Microsoft has been quickly countered by IBM.

Running Windows Applications in OS/2 outlines the initial goals for Win-OS/2—not only the ability to run the gamut of existing DOS and Windows applications unmodified, but also to equal or better "native performance." The wider challenge is then explored: integrating Win-OS/2 and OS/2 2.1 to provide the Object-Oriented User Interface (OOUI) Workplace Shell desktop from which you can launch multiple sessions of "DOS (windowed and full-screen), Windows (windowed and full-screen)

and native 16- and 32-bit OS/2 programs." The authors explain MVDs (Multiple Virtual DOS Machines), VDDs (Virtual Device Drivers), and the vital role of OS/2 multithreading, but not in the intimate detail that would drive even the most powerful "power user" insane.

The bulk of the book is devoted to exploiting Win-OS/2 and improving your DOS/Windows migration and performance. It offers lots of practical hints not found in the IBM documentation, although the writing style tends towards the official plumpen IBM read'n'feel. Compared with VNR's *Using Workplace OS/2* by Lori Brown and Jeff Howard (reviewed here in November 1994, pp. 71-72), the layout and typography are disappointing. In particular, the screen shots are barely legible to my Miltonic gaze, especially those with inverse-video legends. Nevertheless, this book is "pure beef," relentless and authoritative fact. Chapter 7, "Printing in Win-OS/2," for example, will save you untold angst in one of the most frustrating OS/2 domains.

OS/2 Warp is covered in a separate final chapter that is based on the Gamma release, which probably explains why this insider book reached my shelf first. Although a tad tenuous on the BonusPack, the new 20-page chapter is a masterly summary of the Warp advantage.

RESOURCES:

Running Windows Applications in OS/2—A Power User's Guide" (\$34.95)

Ayodele Anise, Teresa Behr Beck & Jean Nemec Shortley, Van Nostrand Reinhold, New York, NY, 1994.

Stan Kelly-Bootle started computing on EDSAC I at Cambridge over 40 years ago and has written at least 11 books. His "Devil's Advocate" column in UNIX Review has been running since 1984. His new book The Computer Contradictionary will appear in the MIT Press Spring 1995 catalog. He welcomes e-mail via CompuServe 70323,1560 or Internet skb@crl.com.

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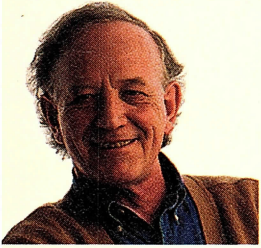
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RUNNING WINDOWS APPLICATIONS IN OS/2 BY STAN KELLY-BOOTLE

As you can guess, IBM's hectic, so-far successful launch of OS/2 Warp 3.0 has been matched by a frantic rush in the computer-book trade to update existing products or create freshly warped titles. IBM is spreading the Warp gospel in high-budget multimedia fashion via conference, television, and press, creating a new heady mix of OS/2 upgraders and novices. Even the couch potatoes were targeted via the IBM OS/2 Fiesta Bowl. People who are browsing the crowded Dalton and Computer Literacy shelves for the latest OS/2 books will expect to find the magic superluminal "Warp" on the spine. You should, of course, be suspicious of decals that say "Covers all the latest OS/2 versions."

Responding to the recent spate of OS/2 enhancements has been a tricky challenge for the publishers. Most of the established OS/2 2.0 titles had scarcely made the relatively big leap to 2.1 when OS/2 for Windows emerged. And now, for maximum readership, authors must also provide for OS/2 SMP (the Symmetrical Multiprocessing version) and OS/2 Warp. In addition, they had the problem of the designational uncertainty: was the name Warp an internal, open-secret code, like the dreaded Chicago, or the official product name? As Alan Zeichick's editorial explained (December 1994, p. 7), IBM's last-minute appellation was not OS/2 version 3.0, but OS/2 Warp 3.0, giving the impression that two earlier Warps had sneaked by. A similar confusion reigns with products such as WordPerfect for Windows 5.1. Marketing folk know less than epsilon about lexical scope and the use of parentheses.

**IBM is
spreading the Warp
gospel in high-budget
multimedia fashion via
conference,
television, and press.**

The considerable overlap between all of the OS/2 versions since 2.1 is a double-edged sword for both author and reader. It's those slight differences that are difficult to document. The most hated predicate in computer science is "almost-compatible." The updated OS/2 book can either add separate, self-contained sections on each new version or interlinear changes can be woven into the text. The former approach is quicker-to-market but leads to page-consuming repetition. The latter approach can easily confuse the reader, who, generally speaking, seeks to install and master one particular OS/2 version. Branching through compound-conditional sentences is no fun: "If you are installing OS/2 for Windows, you will need the original Windows 3.1 diskettes...if your Windows 3.1 was pre-installed, backup diskettes must first be created [mad scramble for your PC manual]...if you are installing from CD-ROM..." and so on. Each node is simple and logical in itself. It's the relentless accumulation of

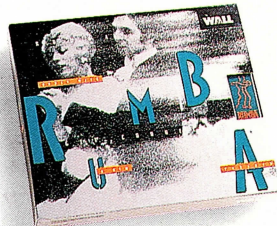
exceptions and choices that challenges the explicator and befuddles the user.

Against this background, I've been dying to see which publisher would hit the OS/2 Warp market first and with which updating strategy. The envelope, please. The winner is Van Nostrand Reinhold (VNR), no surprise to my regular readers, with *Running Windows Applications in OS/2—A Power User's Guide*, by Anise, Beck, and Shortley. I feel bound to tell you that I have no shares in or shady dealings with VNR. Indeed, I was praying that Sybex (imprimatur of many of my own masterpieces) might have breasted the tape first. "Missed it by *that* much..." as Maxwell Smart used to say.

The VNR book sports the ideal front-cover decal: "OS/2 2.1; OS/2 Warp, Version 3; OS/2 for Windows; OS/2 SMP." The authors, Ayodele Anise, Teresa Behr Beck, and Jean N. Shortley are key members of the IBM team that developed Win-OS/2. If the Nobel committee ever establish a software-engineering category*, surely this team will be on the shortlist. Having decided early on that "seamless DOS and Windows support" was essential for OS/2 survival, IBM set up a small back-room lab, managed by Tim Shortley, to brainstorm the problem. If you have just a nodding acquaintance with the quirks

* You probably know that Alfred Nobel eschewed a Mathematics Prize because of his wife's group-theoretic activities. The members of the Nobel committee, however, are free to add categories, such as the Economics Prize, which was established in 1965.

End Notes cont'd on p. 71



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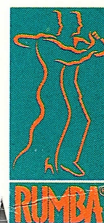
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